

Software-On-Board

SOBv66 User Manual



Software-On-Board is a charting, piloting and navigating program providing a complete navigation solution when connected to a GPS and with appropriate C-MAP Electronic Charts installed.

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The SOB program and information in this manual is offered as-is. Neither should be relied upon for the purposes of safe navigation.


















Digital Charts and Electronic Navigation are not considered a replacement for traditional "manual" methods of navigating.

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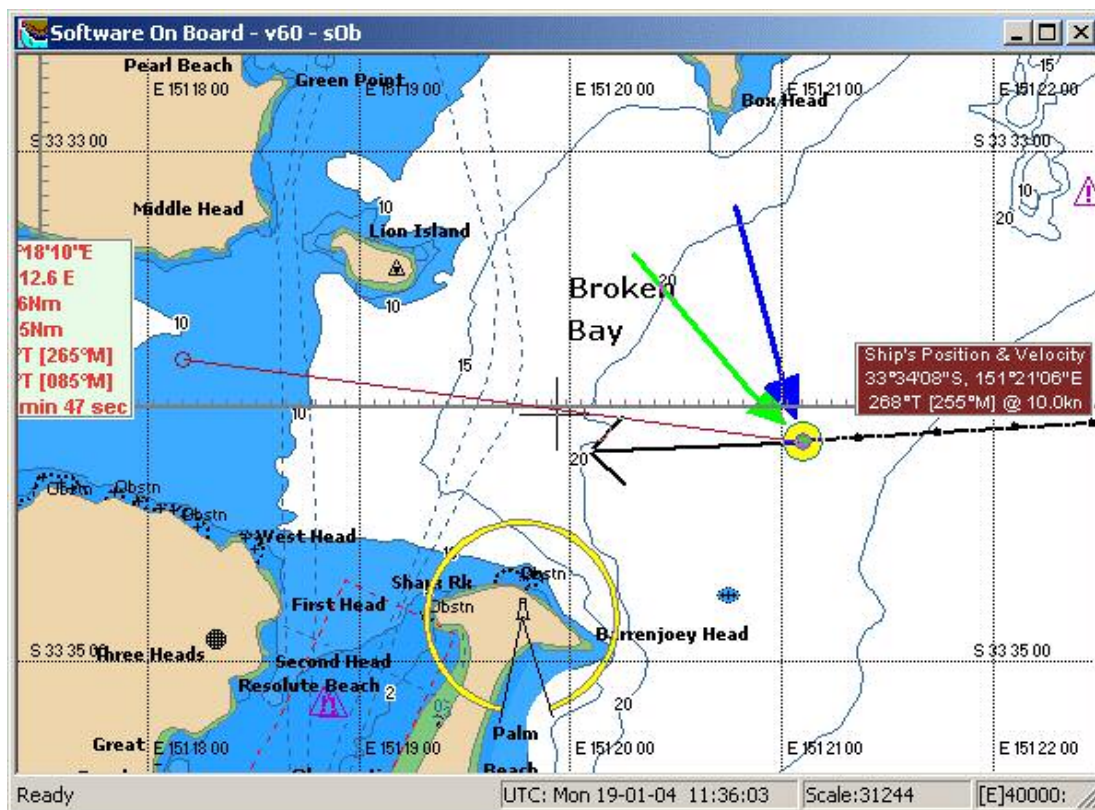
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NMEA is the "National Marine Electronics Association" who controls the standard for "Interfacing Marine Electronic Devices" (www.nmea.org)

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INTRODUCTION TO SOB AND COMPUTER NAVIGATION

- [Welcome](#)
- [Traditional Navigation vs. Computer Navigation](#)
- [Registering SOB](#)
- [SOB Unlock Codes and C-MAP Chart Licence Codes](#)
- [Compatible Windows Versions](#)



WELCOME TO THE SOB USER MANUAL

This On-Line User Manual is broken into different chapters, to ease the amount of "reading" required, to best use Software-On-Board (aka SOB).

SOB has been purposely designed to be equally useful to both:

1. a complete beginner computer user, a novice navigator and an unskilled boatie; or
2. a power user with professional navigation skills and a life-time at sea.

The SOB User Manual has also been structured with this vast range of abilities in mind.

Each chapter of the Manual can be read and studied on its own without the need to refer to other areas. Although further depth of knowledge for some of the easier topics are cross-referenced when appropriate.

Please send any comments or corrections for the SOB User Manual to support@digiboat.com.au

TRADITIONAL VS. MODERN NAVIGATION METHODS

Navigation by ANY electronic means is NOT considered a replacement for traditional methods of navigating.

WARNING

Never rely completely on electronic navigation methods. Always keep a good look-out, acquire local knowledge, observe weather advice and keep updated your almanac and manual navigation skills and use your best judgement in all situations.

Whether navigating by traditional (paper) or electronic (computer) means, always ensure that you have enough charts of adequate detail for the safe navigating and piloting of your intended route and destinations.

Electronic Navigation requires:

1. Software-On-Board navigation program
2. C-MAP Electronic Charts
3. A standard Windows™ PC
4. A NMEA connected GPS

Traditional Navigation methods will require:

1. Calibrated sextant
2. Calibrated compass
3. Chronometer calibrated to 1 second
4. Separate LOG device (to determine boatspeed)
5. Mathematical Tables (to help with the site reduction calculations)
6. Nautical Almanac (to supply celestial information, replaced annually)
7. Site reduction stationary
8. Plotting graph paper
9. Various Paper charts of different scales
10. The latest "Sailing Directions" to apply chart corrections
11. Dividers, ruler, protractor, pencil, pencil sharpener, eraser
12. a higher degree in "something" that allows you to put all this together in rolling seas in a wet cabin at night

NOTE: **SoftwareOnBoard** is not suitable for real-time navigation until:

1. the program has been registered;
2. Appropriate charts have been purchased from C-MAP.

REGISTERING SOB

At DigiBOAT, we believe that easy and accurate navigation should be readily available to everyone.

Thus SOB is distributed as Freeware Software. There is no cost involved with downloading or using SOB.

This means you are free to use, copy and re-distribute the SOB program in either its "installed" or "installable" incarnations. You must include all installed files in the SOB folder if you re-distribute the program in any way.

It is important to register your copy of the SOB program. Registration and unlocking SOB is free. **Register** your use of SOB, and obtain a **SOB Unlock Code** from <http://www.digiboat.com.au>

Apart from allowing us to notify you when updates and new versions become available, registered users can unlock certain additional features within the program.

We strongly encourage you, and all you distribute to, to register the use of the program.

Advantages of Registering

- Registration is **FREE**, and updates or upgrades notifications will be emailed to you
- You can download the latest release of SOB
- Registered users can **Unlock** SOB for running on up to five different computers, to enable additional parts (extra tools, more routes and waypoints etc) of the software.
- Registered users will receive free **on-line technical support**, and free or reduced price future access to upgrades and updates.
- Registered users can request the **C-MAP NT/PC Chart** disks to be posted to them for easy chart selection and instant on-line purchasing
- You receive a **5% discount** when ordering C-MAP charts on-line
Use Reseller Code **R30-468** (when, and if, prompted)
- You can become a contributor of our **Dream Features** competitions to add to a future version



SOB UNLOCK CODES

Registered SOB users can request up to 5 **SOB Unlock Codes** with the form linked on the "Register" web page.

Each computer will generate a unique **PC_CODE** on the **About SOB** form. Press the green-question-mark button (pictured) to get the unique PC_CODE for your computer, enter it into the web form, then enter the Unlock Code received via email, back into the box on the **About SOB** form.

The standard Unlock code will enable **AccessLevel=1**. This level of access will allow unlimited Waypoints and Route TurnMarks, and will enable additional features in the program.

AccessLevel=2 is available by request (email support@digiboat.com.au) and, in addition to enabling all of the Level-1 bonuses, it also enables the **APA** and **APB** autopilot output NMEA sentences on the **Raw NMEA data** form.



C-MAP ELECTRONIC CHARTS

NT+ Cartridges and **NT+ /PC** are the only formats compatible with SOB.

The obsolete **CF85** and **CM93** formats can not be used with SOB. Owners of these old charts should inquire with their local C-MAP Dealer or Office for generous upgrade pricing for the new versions.

SOB comes complete with 15 full detail Demonstration C-MAP NT+ Charts for your evaluation purposes. Use these charts to trial both SOB and the C-MAP digital chart system for your own needs.

To use other specific C-MAP charts for your area, you will have to purchase the **Chart Licence Code** from C-MAP directly.

See also: [Quick Start Chapter](#), [C-MAP Charts Chapter](#) and <http://www.digiboat.com.au/C-MAPCharts.htm>

COMPATIBLE WINDOWS™ VERSIONS

We don't recommend **Win9x** or **WinME** for mission critical computer use (such as real-time navigating) due to their relative instability compared with **Win2000** or **WinXP**, and we freely admit that SOB can be unreliable running on these pre 2000 operating systems.

SOB has received no reported problems running on Win2000 or WinXP computers - these are also inherently stable operating platforms. SOB has had no testing, and no feedback from our users, about its performance on the **WinNT** platform.

Software-On-Board has known problems with some installations of Win98 and WinME. Typically these problems occur while zooming, and usually become apparent during your first "play" with SOB.

In detail, symptoms are screen freezing (usually requiring a re-boot) after either 5 minutes or about 45 minutes of "up-time". Additionally the Data display boxes (ViewPanels) don't render accurately with Win98 (the data is accurate - just the formatting, noticeably centring, is wrong).

No known problems occur with Win2000 or WinXP, and we felt it prudent to not compromise the stability with Win2000 and XP by attempting complete backward compatibility with the older operating systems. Microsoft is reportedly discontinuing their support of these older versions of Windows this year.

Nevertheless there is no real reason that SOB won't run on a stable installation of Win9x - it's just that it doesn't always! Many users have reported success running SOB on Win98, WinME, even Win95.

Virtual PC's

Several users have reported success with running SOB on virtual PC's under both the Linux (MIME) and MacIntosh operating systems, using Windows™ emulation software. Although configuration of the serial ports is sometimes difficult and occasionally impossible.

Please note that DigiBOAT does not support, nor recommend, the use of SOB under non-Windows™ operating systems.

| [Manual Index](#) | [Quick Start Chapter](#) >>

QUICK START

- [General Introduction](#)
- [Mouse actions and Keystrokes](#)
- [SOB Toolbars](#)
- The "Ship's Target"
- [Zooming and Panning](#) the chart
- The "Quick Navigation Line"
- [Waypoints](#) (Chart Marks)
- [Ship's Data Panel](#)
- [ViewPanels](#) - Navigation, Destination & Messages
- [C-MAP Charts](#) (demos, installed, levels, licencing)
- [Abbreviations, Acronyms](#) and [Short Glossary](#)

GENERAL INTRODUCTION TO SOB

Firstly, it is important to notice that NO menus exist within the SOB program. All features and functions are designed to be used with a touch-screen or mouse. You will rarely need to use the keyboard when navigating onboard. However, don't be dismayed that the lack of menus equates to a lack of features – SOB is packed with features surpassing most navigation programs available, these features are easily accessible when, and if, required. Browsing through this manual will provide an overview of the sheer "depth" of SOB.

SOB is not a typical Windows™ software program, when using SOB it is best to regard it as a **Navigator's Tool** rather than a computer program. You should not have to "search" through level upon level of menus to find essential navigation data ... SOB presents this information graphically and intuitively directly on the chart surface, when, and as, you need it.

Access SOB's features quickly through the Toolbar or by clicking directly on a chart symbol or tool. Panning and Zooming is a fast and easy one-click process with a [wheel-mouse](#).

SOB is designed to be easily used either at home planning or dreaming, or on board in a real-life environment. If using at home, then we recommend you work through as much of this manual as possible while using the program in a simulation mode. To simulate real-time use, use either **Dead Reckoning** mode or **Voyage Replay** mode from a logfile. (A number of logfiles are included with the installation, mostly around Sydney and Auckland - areas with demo-chart coverage).

In a real-life navigating environment (plugged in to a GPS while moving), SOB will work with no additional setup or configuration. The **Ship's Target** will immediately move around the chart display showing your exact position, and any navigation data from connected instruments will be displayed.

A mouse with a [middle-wheel](#) is the best tool to use with SOB (ideally in combination with a touch-screen), and a keyboard does not greatly enhance SOB's useability.

When text input is required (ie: to input the co-ordinates of a dead reckoning position, or to type a name for a Route or Waypoint) an onscreen keyboard can be used, (the virtual keyboard is automatically installed with Win2000 and WinXP).

Of course, a regular keyboard can be used for inputting data, but generally speaking, put the keyboard in a draw while navigating - there are no special keystrokes or keyboard commands that can't be performed without the mouse.



SOB is most simply used with a
touch-screen or cordless mouse

MOUSE CLICKS & EQUIVALENT TOUCH-SCREEN ACTIONS

- "Touch" is the same as **Left-Clicking** the chart
- "Slide" is equivalent to **Left-Drag**
- "Press" is what you do to Buttons or Check Boxes
- **MouseWheel** will perform fast zooming, by changing chart detail levels
- **Middle-Click** at any time to centre chart
- **Middle-button Drag** create a Zoom Window into the chart by dragging from top-left to bottom-right
- **Right-Click** at any time to view data about that chart point (same as Info->Touch)
- **Double-Click** the chart to display the NMEA data form
- **Touch/Slide** along chart edges to pan chart (when Auto Panning button depressed)
- Some actions involve **Touching** the chart twice. Note: this is NOT double-clicking, the first Touch selects the item, Touching it again performs the action (i.e: showing a form)

KEYBOARD SHORTCUTS

- [Space] Refresh chart display and tool drawings, centre ship, reset over-zoom state.
[Alt-Space] Go to exact position, chart level, and display scale.
[0] (zero) Set displayed chart to its un-zoomed scale. (Resets the zooming mechanism if it "locks up")
[D] & [U] (Down/Up) Zoom in/out, keeping the same chart centre
[I] & [O] Zoom in/out using the current mouse position to centre the chart
- [F1] **Help Screen** Quick prompt screen for available Keystrokes and mouse actions.
[F2] **Level Toolbar** Allows particular chart Level selection, and quickly shows what chart Level is currently displayed. When choosing a level that is unavailable, SOB (and C-MAP) will show the closest detailed level available. Note: that sometimes this is based on the centre of the display, and sometimes on a calculation as to which level detail has the greatest screen area displayed. The level chosen is also dependant on the Chart Toggles, as described next ...
[F3] **Chart Toggles** The top half of the ChartToggle ToolBar concerns which charts C-MAP will automatically display based on a scale and position on the screen. Briefly: **ChartLock** – only allows panning to an existing chart. Will move up levels (to less detailed) until the first with data is found whenever the screen is panned into a "grey" area (ie: no coverage on current level). **OverZoom** should always be ON for most chart configurations and chart usage. **SkipEmptyLevels** will display only levels that exist when zooming - should also be ON for most usage. **VirtualCharts** is will allow unlimited zooming – but to "course scale" charts at times (ie: heavily over-zoomed), typically useful for accurate calculations and measurements. **MixLevels** can be slow on weaker computers, however aesthetically useful for avoiding the "grey" areas by drawing the previous available level as a "fill". The lower half of the ToolBar toggles settings that display or hide certain elements of the C-MAP Cartography. Their labels are self-explanatory. (Except maybe **Graticule** which is the lines of Lat and Long).
[F4] **Toggle Different Display Palettes**
Green-Screen (ie: old CRT style); Grey-Scale; CM93 Colours; Pale; Dark; Standard
[F5] **Depth Display Toggle**
Toggles display of **SpotSoundings** of depths and **SeaBed** material for various (random) points over the chart. Inter-use of [F5] and the **DepthSoundings** toolbar button [F3] will also show/hide the depth markings on the depth contour lines.
[F6] **Mixed Chart Level Mode**
Toggle level-mixing ON/OFF. IF no detail chart is available for a chosen level, then the previous less-detailed available level will be displayed with areas of better coverage overlayed. NOTE: (1) less detailed charts will be displayed with a "dotted" pattern overlayed, (2) Less detailed charts will not necessarily "line-up" exactly with more detailed charts, (3) the display refresh will be slowed when in mix-level mode.
[F7] **Cycle Night-Modes** Continuous pressing of the [F7] key will cycle through various display brightnesses, for use as a "night-mode" chart display.
[F8] **Declutter Mode** This is the same as using the [Declutter] button on the main toolbar.
[F9] **Display Ship's Settings Form** This is the same as clicking on the Ship's Target.
[F10] **All Waypoints Form** This is the same as **Info>>Waypoint** Toolbar button combination.
[F11] **All Routes Form** This is the same as **Info>>Routes** Toolbar button combination.
[F12] **Angle and Length Converter Form**
For inter-converting between Degrees/Minutes/Seconds with their various decimal options.
For converting between KM, NM, MILES, METRES, FEET and FATHOMS

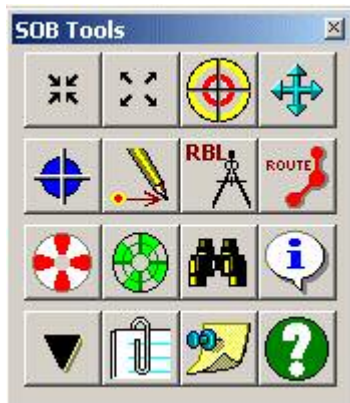
TOOL BARS

SOB contains three toolbars, the Main SOB Tools, Chart Toggles, and Chart Levels.

The Main Toolbar is discussed next, refer to Advanced Tools for details about the Charting Toolbars.

All Toolbars can be "undocked" from their default positions along the edges of the screen or "re-docked" to any edge. They can also be reshaped (drag an edge to snap the toolbar into a different shape) and placed anywhere that's convenient.

The SOB Main Toolbar



This picture of the SOB Toolbar demonstrates how it can be "undocked" and reshaped. The undocked toolbar is then easily re-positioned to provide more area for displaying the chart.

SOB Tools provides access to SOB's main functions:

- Chart Zooming
- Centre Ship (auto centre Ship)
- Auto-Pan
- Draw Waypoints, Edit Waypoints (Show AllWaypoints Form)
- Quick Navigation Line
- Range and Bearing Lines
- Draw Routes, Edit Routes (Show AllRoutes Form)
- Man-Over-Board
- Show RADAR Form
- Locate Ports and Services
- Quick Chart Information, Right-Click Chart Info mode (Alt. button mode - for Centre Ship, Waypoints and Routes)
- Control ViewPanel displays
- Show/Hide all ViewPanels
- Declutter Chart Display
- SOB information, Registration and Unlocks
- C-MAP Charts installed and Run C-MAP Selector program

NOTE: Entries in brackets are accessed by first pressing the Info button

The main toolbar **SOB Tools** can be closed when it's undocked by clicking the cross in its top right corner. Close the toolbar to "protect" the navigation display once setup and active, without the toolbar displayed, the current setup can't be inadvertently changed. The only way to retrieve the main toolbar once it's been closed is to restart SOB.

STATUS BAR

33°40'41"S, 175°15'34"E 51Nm 356°T [338°M]	UTC: Wed 18-08-04 04:58:04	Scale 1500000:1	[B]:1093564	COM5	RealChart
--	----------------------------	-----------------	-------------	------	-----------

The continuously changing data on the left side of the Status Bar relates to the latitude and longitude of the mouse pointer; followed by the distance and direction (true and magnetic) from the Ship's Target to the mouse position.

Next is **UTC** (which is the same as **GMT**), this is the current time along the Greenwich Meridian (0° longitude) as determined by your computer clock and time zone (as set by Windows™ Control Panel). If UTC is not set correctly, then use Control Panel to adjust your local time settings accordingly.

The first **Scale** data field (Scale 1500000:1) displays the creation scale for the current chart displayed, followed by the current **Chart Level** ([B] in the picture) and scale considering the current zoom factor. The most right-hand text indicates whether the chart is being displayed at or close to its creation scale (RealChart) or if it is zoomed in or out (OverZoom) or if it is greatly zoomed-in (VirtualChart).

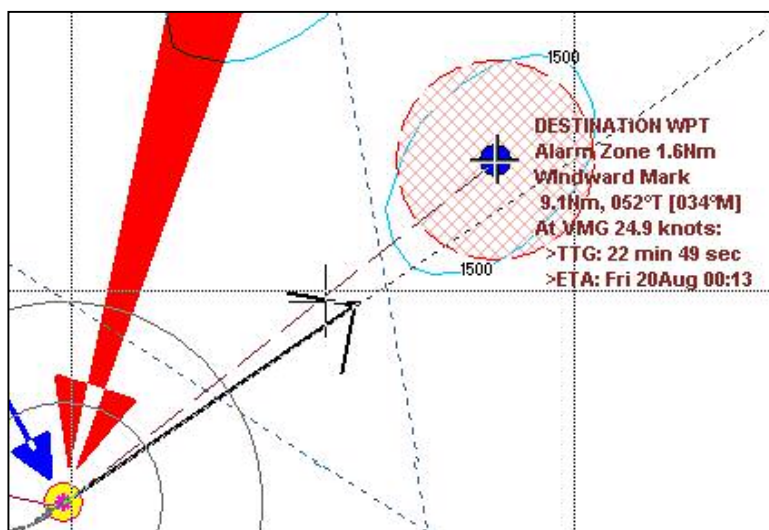
NOTE: OverZoom or VirtualChart displays will not necessarily show all chart features in their precise geographic locations. SOB should NOT be relied upon for close-up real-time navigation while in either of these chart states.

The **COM** indicator will show **NoCOM** if communication has been disabled (via the Raw NMEA Data form, or because no Serial Ports were found), or **COMx** will be displayed (where "x" is a number from 1 to 15) if SOB has found an available and compatible Serial Port to use. Following the COMx is the **baud** rate used to connect to the external devices. SOB defaults to **4800baud**, contact support@digiboat.com.au if you need to communicate at higher speeds.



SHIP'S TARGET

Press the **Centre Ship** toolbar button or use the **[space]** key to redraw the chart display with the Ship in the centre of the screen.



The exact **Ship's Position** on the chart is indicated by the red-and-yellow "bullseye".

The large red arrow represents the **Apparent Wind** speed and direction relative to the ship's direction, shown by the black arrow. The blue arrow is the **True Wind** as calculated from the ship's velocity and the apparent wind data (if available).

Customise the display of the wind vectors, and the ship's symbol using the **Setup Ship** form. Display the form by clicking the Ship's Target at any time, or using the **[F9]** shortcut key.



Auto Centre Ship's Target

Press the **[Info]** button, followed by the **[Centre Ship]** button to "lock down" the [centre ship] button.

This will put SOB into **Auto Centering** mode – and won't allow the Ship to sail off the screen. The display will automatically re-position the chart to keep the Ship's Target visible at all times. Disable Auto Centre mode by pressing the [Centre Ship] button on its own.

SETUP SHIP'S POSITION FORM

The Ship's Position is easily moved to any location:

1. centre the chart at the desired new location
2. display the **Setup Ship's Position** form (zoom-out or use [F9] shortcut key if the target is not visible to click)
3. press the [Set] button, then [Close] the form

Alternately, enter specific co-ordinates in the Latitude and Longitude boxes, then press [Set].

Note: Lat and Long are entered in DECIMAL-DEGREES format, use the easy [Converter] form to find **DD.dddd°** from either **DD°MM.mm'** or **DD°MM'SS"** formatted angles.

- **Dead Reckoning...** refer to [Easy Tools](#)
- **Ship's Position Label** freezes its value until the next screen refresh. It can be turned off or shown in different ways
- **Ship's Vector** can be hidden or displayed in fixed or speed related sizes. For instance, use the "Long" setting if speed is wildly fluctuating and the "Stretchy" arrow is annoying. The "Short" setting is best when moving at speeds under 2 knots.
- **Lubber Line** is a dotted line through the centre of the ship and extending along the exact heading
- **Course Line** if a N2D scenario is active, a dashed line is drawn from the ship to the destination
- **Range Rings** circling the ship are optionally displayed. Auto Size will size the rings so the outer ring will fit within the screen area. The range selected is displayed on the **Ship's Position Label**
- **Hollow Target** the Ship's Target is best against a white background - such as C-MAP charts display along most navigable waters. At times, the target displays more clearly when hollow, with heavier rings drawn.
- **Past Track** can be hidden by clearing the checkbox. Delete the displayed track with or without first logging it, or convert the current past track to a route file.
- **Chart Orientation** rotates the chart according to your selection. "Destination Up" will only be available if a N2D scenario is active.
- **Wind Tools** ... refer to [Advanced Tools](#)



ZOOMING AND PANNING THE CHART



An optical (no ball) cordless mouse with a middle wheel is recommended to maximise SOB's ease of use.

Panning and Zooming is conveniently performed with the **middle-wheel**. Spin the wheel for fast zooming (by changing chart level when possible); and pan the chart by clicking with the middle-wheel. Also use the **middle-button** to "drag" a resizing "zoom window" around an area of interest. (see the example below)

Pan by selecting a new centre...

Move the chart freely and quickly around the screen by clicking a point on the chart to centre the display at that position. The StatusBar shows the Lat/Long at the mouse position, that will become the new display centre.

To Pan vast distances, first zoom out a few steps, then continuously click the appropriate side of the screen.

The new chart centre can be chosen by **left-clicking** any place, providing no other click condition receives priority (ie: left-clicking the Ship's target ALWAYS gives priority to showing the Setup Ship's Position form). The **middle-click** always centres the display at the point clicked on the chart, regardless of what ever tools may be active (Route drawing, Waypoint tool ...).

AutoPanning



When the **AutoPan** toolbar button is pressed, the chart will pan whenever the mouse pointer moves to within about an inch (2.5cm) of any edge of the displayed chart. To continue to pan the chart, the mouse pointer must be moving. Disable AutoPan mode by pressing the button again.

Zoom with the Mouse-Wheel, the Toolbar Buttons, or a Zoom-Window...

Use the buttons to step in or out of the chart in steps that approximately halve or double the current displayed scale. The zooming mechanism will avoid over zooming a chart and will instead change to a more suitable chart level for the requested scale. The zoom buttons will allow zooming to a very small scale, beyond any available detailed levels, however the coastline will be very inaccurate in this highly zoomed state. If the zooming mechanism ever feels "locked-up" pressing the [0] (zero) button will reset the zooming.

The **mouse-wheel** will generally not zoom the charts to a high over-zoomed state. However if the chart has been zoomed in by other means, the wheel zooming will follow these prior steps.

Zoom to a Window by dragging a rectangle shape with the middle-button (or clickable wheel), from the top-left corner to the lower-right corner, surrounding the area of interest. It is usually possible to zoom from a continental scale overview, down to an individual harbour with two steps.

See the example that follows ...

Example using the Middle-Mouse-Button and a Zoom Window

From World Wide Overview Chart, to Sydney Harbour with two mouse clicks!



Chart Level Z
Scale: 5,000,000 : 1

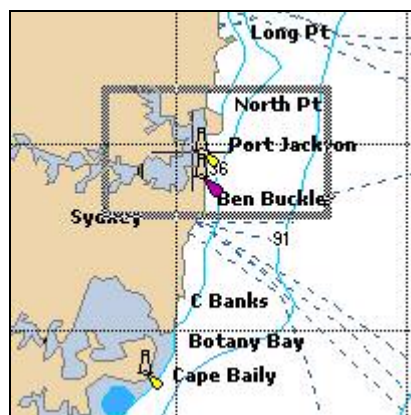
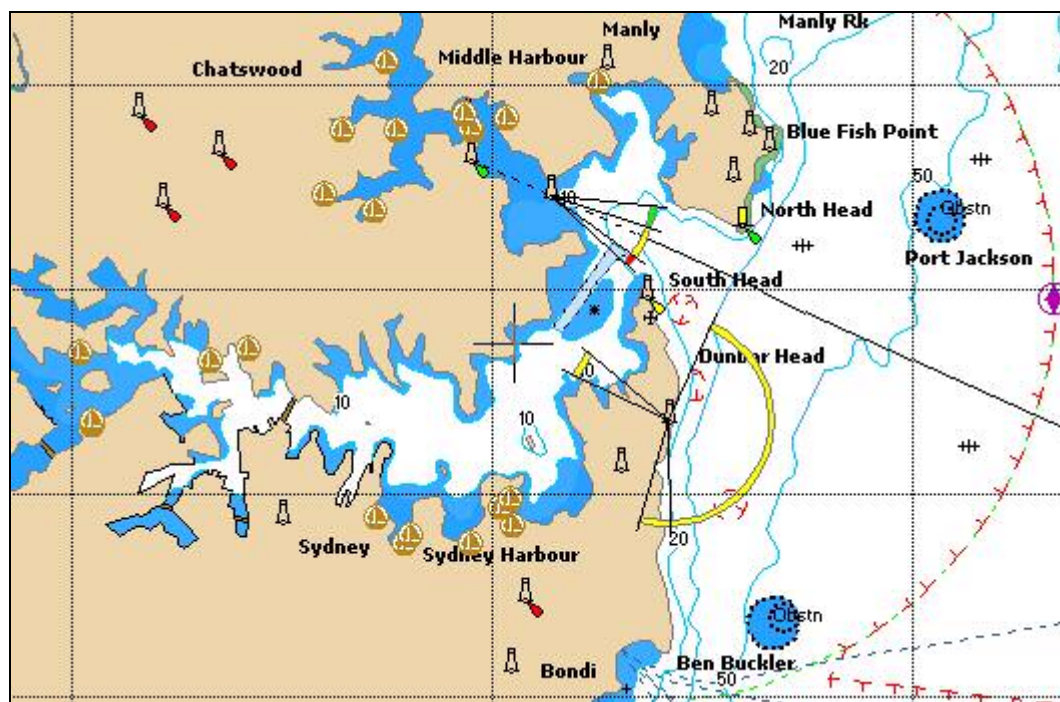


Chart Level B
Scale: 600,000 : 1

Chart Level D Scale 100,000 : 1





QUICK NAVIGATION BOX TOOL

When SOB first starts, there will be a red line emanating from the Ship's Target. This is the **Quick Nav Line** which defaults to position zero-zero or the Gulf of Guinea (so NW from Australian locations). You can hide this line by using the [Declutter] button.

33°49'23"S, 151°18'15"E
Mag Variation: 12.6 E
GreatCircle: 1,240Nm
RhumbLine: 1,187Nm
Bearing: 274°T [261°M]
Reciprocal: 094°T [081°M]
Time To Go: 1day 18h44m

The **NavBox** displays brief navigation details from your Ship to that point. The "Time To Go" is calculated based on a straight line from your current Ship's Position to the marked point, at your current SOG or BoatSpeed.

The **NavBox** can't be hidden. This is a frequently used tool (once you get used to it) and most of the time it will be in your display area, when you don't want it cluttering the chart, zoom out or pan and move it out of the way.

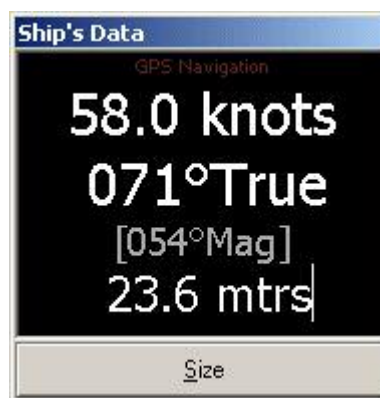


SHIP'S DATA PANEL



Use the down-arrow toolbar button to drop down the **Data Display** button menu.

The **Data Display** is used to show/hide the Ship's Data ViewPanel, and select the data to display in the Navigation ViewPanel (described next).



NOTE: if some of the text is lost off the panel when resizing, contact support@digiboat.com.au for instructions on how to customise the "aspect ratio" of this panel for your particular display

The **Ship's Data** ViewPanel displays important and immediate navigation data.

There are three different modes for this panel:

1. **GPS Navigation:** the box will be painted black and represent data received via NMEA instruments (GPS and DepthSounder).
2. **DeadReckoning Navigation:** will display a pale-blue panel, and show course and speed as set in the "Setup Ship's Position" form.
In DR mode, the **Magnetic** course value will be more prominent, as DR navigating is typically performed by steering to a compass course.
3. **Voyage Replay Mode:** will also appear in a pale-blue panel and repeat pre-recorded data when a log file is being replayed

Use the **[Size]** button to toggle through three different sizes for this panel, to make visibility of this data from the cockpit, easier.

Hide/Show this panel using the **Data Display** toolbar (see above).



VIEWPANELS

Press this "paper-clip" button to show or hide the ViewPanels.

If ALL ViewPanels are closed manually (using their [Hide] buttons), then this button will need to be pressed twice to re-display the panels. If active, the "Navigate to Destination" panel will not be hidden with this button. Notice that when a Man-Over-Board event is active in the Destination ViewPanel, the [Hide] button is not available.

The ViewPanels:

- **Messages:** displays messages about ArrivalZones alarms, AnchorZone alarm etc
- **Destination:** Navigation data when an N2D scenario is active
- **Navigation:** Time, Wind, Routes and PastTrack information



Messages ViewPanel

A variety of running messages are posted to this panel automatically by SOB.

Some of these messages require no further interaction, however some messages are ALARM conditions (and are signified with a buzzing alarm sound) and require attention by the navigator or helmsman.

This panel can also be typed into by the operator to make separate notes or "watch" information, etc. Existing text in the panel can be manually deleted using regular text editing techniques (use CTRL-ENTER to start a new line when typing).

The text in this panel is periodically cleared and logged to a file:
\SOB\Logfiles\!messages.txt

This file is a plain text file which can be opened in **Notepad.exe**, for review or printing etc...



Destination ViewPanel

This panel is automatically enabled whenever one of SOB's "Navigate to Destination" (N2D) scenarios is activated.

N2D's in order of priority:

1. Man-Over-Board
2. Waypoint set as a Destination
3. Activated Route

This panel supplies all the information required, at a glance, to assist you with arriving at your destination.

NOTE: The VMG represents that component of your speed AND direction that is helping you get to the destination. If you are steering away from the destination, then VMG will be negative.



The screenshot shows a window titled "Navigation" with a light blue background. It displays the following information: PC: Thu Aug 19 13:20:14 2004, GPS: Thu Aug 19 13:20:12 2004, Meridian Time: 23:32, Zone: X-ray GMT-11, True Wind 254°T WSW, 52.6kn, Apparent 050°T NE, 5.8kn, 21° off Port Bow, Max Gust T52.6, A 5.8, No routes are loaded, No Routes Selected, No Routes are Active, PastTrack: 6 hrs 06 mins, 2739 PastTrack Markers Visible. At the bottom is a "Hide" button.

Navigation ViewPanel

Select which extra information to display in the Navigation ViewPanel with the Data Display menu (described above)

Information relating to Time can be displayed in this panel:

Meridian time is based upon your current longitude and can be different to your Time Zone established by National governing bodies.

Wind information is available if an Apparent Wind Instrument (anemometer) is fitted to the boat and connected via NMEA to SOB.

Route summary data is listed here, for detailed Route data, refer to the **Route Details** form.

PastTrack summary detail is displayed if selected on the "Setup Ship's Position" form. Detailed PastTrack information is continuously logged to: **\SOB\Logfiles\!pasttrack.txt** and can be imported into Excel for deeper analysis of the voyage.



WAYPOINTS

...see also [Easy Tools](#)

Waypoints in SOB are a multi-purpose tool for placing a mark or event directly on the chart surface. The waypoints can be grouped into separate files and loaded or unloaded in a SOB session at any time.

Press the **Waypoint Tool** button on the Main toolbar to enable Waypoint Mode.

Create a new Waypoint

Touch (left-click) on the chart to place a mark at that position. A confirmation form will pop-up. Set some basic features of the Waypoint and accept by pressing the [OK] button, or press the [More...] button to open the **Waypoints** form.

A Waypoint can be placed at the current ship's position by pressing the MOB button, then releasing the button to end MOB mode – then rename and configure this Waypoint as desired (wait until the Ship has moved off this position before you try to change the Waypoint's settings).

Change a Waypoint

Touch an existing waypoint mark to open the **Waypoints** form. This form shows detailed Waypoint information and waypoint settings can be changed.

Delete a Waypoint

Click a Waypoint to display the Waypoints form. Press the [Delete] button on the form, then [OK] the warning box.

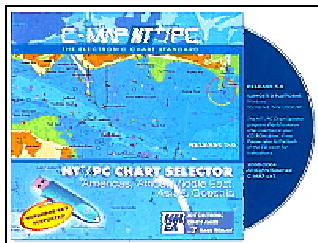
Hide a Waypoint

Click a Waypoint to display the Waypoints form. Toggle the [Show/Hide] button. The waypoint will still be visible on the chart, but only as a small dashed circle.

INTRODUCTION TO C-MAP CHARTS

SOB comes complete with 15 full detail Demonstration C-MAP Charts for your evaluation purposes. Use these charts to trial both SOB and the C-MAP digital chart system for your own needs. Specific charts for your area will have to be purchased from C-MAP directly.

The C-MAP Charts are available on CD-ROM or on the NT+ Cartridges.
Either of these charts, indeed both in combination, are suitable for use in SOB.



C-MAP NT+ /PC Charts (CD-ROM version)

The CDs containing all the World's C-MAP charts are supplied by C-MAP (registered SOB users had the option of having these disks posted to them at the time of registering, otherwise they can be ordered direct from C-MAP at any time).

Specific charts on the CDs must be selected and licenced prior to use. A simple program **NT/PC Selector** is included on the C-MAP CDs to allow easy chart selection and immediate on-line or call-centre ordering. C-MAP will only supply you with a Licence Code which will unlock the purchased chart allowing SOB full access to it.



NT+ C-MAP Cartridges

Commonly used in chart-plotters from a variety of manufacturers, these cartridges can also be used by SOB on your computer. An accessory, supplied by C-MAP, is the **USB C-CARD Reader** which connects to your computer via a USB port, and will permit use of any NT+ C-MAP Cartridge within SOB.

The Card Reader can take two C-MAP cards at one time, and further chart cards can be "hot-swapped" without the need to close or re-start SOB.

Chart Areas and Chart Levels

Areas/Regions

C-MAP Charts are purchased as groups (or folios) of charts of a variety of different scale ranges to cover a particular area or region. The **NT/PC Selector** program included on the CD-ROMs is the easiest way to identify and/or purchase chart regions.

C-MAP areas, or regions, are denoted by: Wide, Wide+ (plus), Superwide and Superwide+.

A Superwide+ region would typically cover an entire side of a National coastline (eg: US East Coast, Australia East Coast, New Zealand North Island) and contain hundreds of equivalent paper charts in all scale ranges for all charted areas within the region.



All chart areas and chart levels that are available for SOB to use, will be totalled and summarised in the **About SOB** form.

In the example image: **C-MAP charts installed** equals **19**, (and is comprised of all possible C-MAP chart types that SOB can use):

WorldWide background chart	1
Demo C-MAP Charts	15
NT+/PC Licenced Charts	2
NT+ Cartridge chart (with USB Reader)	1
Total Installed C-MAP Charts	19

Use the **[C-MAP]** button on the **About SOB** form to get a detailed listing of installed C-MAP charts.

NOTE: if many charts are installed, then this action can take A LONG TIME - 20 charts on a 1000Mhz CPU can take three minutes.

Levels

C-MAP Charts are built of different **Levels** (A-G and W-Z) each level is a different scale range. Levels A-D for coastal navigating and E-G for harbour-level chart detail. ...see [Table of Level Scales](#) page 38

SOB will always be installed with two World Wide background level charts, C-MAP **Level W** and **Level Z**. If other detail chart levels are available they will appear as grey **bounding boxes** (as shown around Seattle, Hawaii, Florida, Panama in the image below).

Levels-within-levels will also be shown as bounding boxes when zooming in and out through the levels. (more about levels: [StatusBar](#) page 9, [ChartLevels Toolbar](#) page 38)



ABBREVIATIONS & ACRONYMS

SOG	Speed Over Ground	SPD	Speed (over water)
COG	Course Over Ground	HDG	Heading (over water)
ETA	Estimated Time of Arrival	BRG	Bearing
TTG	Time To Go	kn	Knots (Nautical Miles per Hour)
		Nm	Nautical Mile
XTE	Cross Track Error		
VMG	Velocity Made Good	LAT	Latitude
RBL	Range and Bearing Line	LNG	Longitude
RTE	Route	RNG	Range
WPT	Waypoint		
°T, °M	Degrees True, Degrees Magnetic		
°C, °F	Degrees Celsius, Degrees Fahrenheit	DTS	Direction To Steer
MagVar	Magnetic Variation	TZ	Time Zone
LKP	Last Known Position	MOB	Man Over Board
GC	Great Circle (orthodrome)	DR	Dead Reckoning
RL	Rhumb Line (loxodrome)	N2D	Navigate-To-Destination
h, m, s	Hours, Minutes, Seconds	NMEA	National Marine Electronics Association
UTC,GMT	Universal Co-ordinated Time, Greenwich Mean Time	C-MAP	Short company name (for C-MAP Electronic Charts) supply the charts that SOB displays

QUICK GLOSSARY

Dead Reckoning

A method of navigating using an estimation of your current position, course and speed. DR is typically used when (1) the GPS is unavailable, or (2) to simulate a passage when away from the boat.

Boat Speed, SOG

Boat Speed is the speed through the water as measured by manual means or with an onboard LOG. Speed-Over-Ground is your speed relative to the Earth's surface, as measured by a GPS.

Compass Heading, COG

Compass Heading is your course as measured by an onboard magnetic or electronic compass. Course-Over-Ground is the true heading measured by a GPS.

Great Circle, Rhumb Line

Rhumb Line is a straight line course on a Mercator chart (C-MAP charts in SOB use the Mercator Projection). RLs follow a constant magnetic heading, and mathematically are known as a "loxodromic" curve. Great Circle courses represent the shortest distance between two geographic locations, but require a continuous change in the ship's heading.

PastTrack

The "tail" or "bread-crumbs" behind the moving ship that indicates the exact path taken by the ship. Show/Hide, log, delete or convert to a Route the PastTrack using tools on the Ship's Settings Form. Further analyse the PastTrack by importing "**SOB\Logfiles\!PastTrack.txt**" into Excel.

Ship's Target

SOB's indicator showing the current ship's location.

Display of the Ship's Target can be customised with the Ship's Settings Form.

EASY TOOLS

- [The Conversions Form](#)
- [Chart Symbols](#), Marine Services and Tides
- [Range and Bearing Lines](#)
- [The PastTrack](#)
- Introduction to [Navigate to a Destination](#)
- [Making SOB "Come Alive"](#): GPS Connection, Dead Reckoning, Voyage Replay
- [Drawing Routes](#)
- [Waypoints form](#)
- [Man-Over-Board](#)
- Managing Waypoint files: [AllWaypoints Form](#)
- Managing Route files: [AllRoutes Form](#)



THE CONVERSIONS FORM

Conversions [X]

Enter any combination of parts of an angle

Degrees °	Minutes '	Seconds "
175	30.5	

Degrees-Decimal (dd.ddd°)	175.50833
Degrees,Decimal-Minutes (dd°mm.m')	175°30.5000'
Degrees,Minutes,Seconds (dd°mm'ss")	175°30'30"E

Distance

Metres	3704.0	Kilometres	3.704
Feet	12152.2	Nautical Miles	2
Fathoms	2025.4	Statute Miles	2.302

Use the **[F12]** shortcut key, or press the form button (all forms that input angles or distances provide easy access to this button), to display the **Conversions** calculator form.

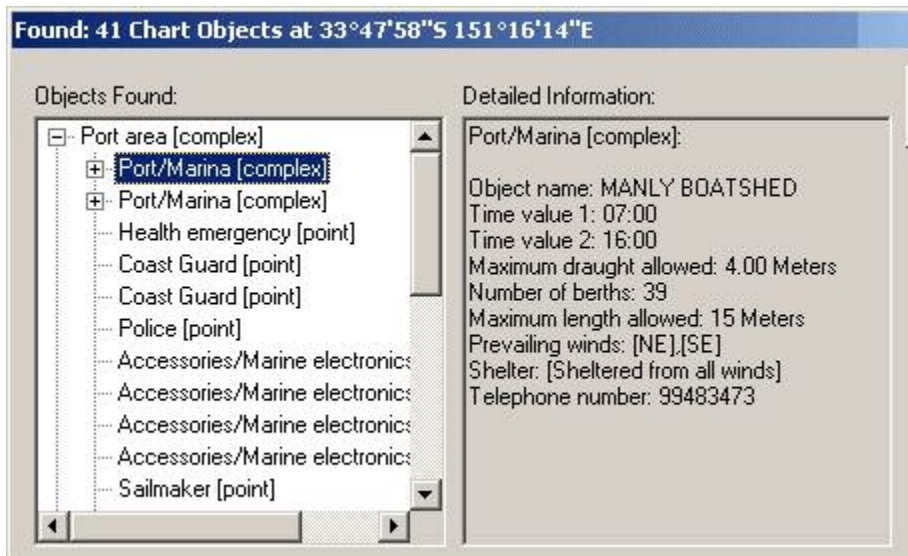
Enter any format **angle** to convert
between the three possible combinations:

- Decimal Degrees: **DD.ddd°**
- Deg, Dec-minutes: **DD°MM.mm'**
- Deg, Minutes, Seconds: **DD°MM'SS"**

Notice that: entering a "sexagesimal" bigger than 60 will increment the higher order. eg: 95 minutes entered will be 1°35' plus whatever Degrees were entered. Once a decimal point is entered into either the Degrees or Minutes boxes, other boxes will be disabled to prevent entering an invalid combination of Deg, Min and Sec.

To use the **distance** converter, simply enter your number in the correct "known" box, the other possibilities will be automatically filled. In the example, "2 Nautical Miles" was entered.

CHART DATA, NAUTICAL INFORMATION, MARINE SERVICES



Display detailed information on chart objects and chart symbols ...

Right-click or **Info>Left-click** on any chart object or symbol to display detailed data for that position. This data could be: navigation lights, piloting info, yacht clubs and marinas, current streams, depths, hazard areas or warning areas, marine parks or fishing grounds etc etc etc.

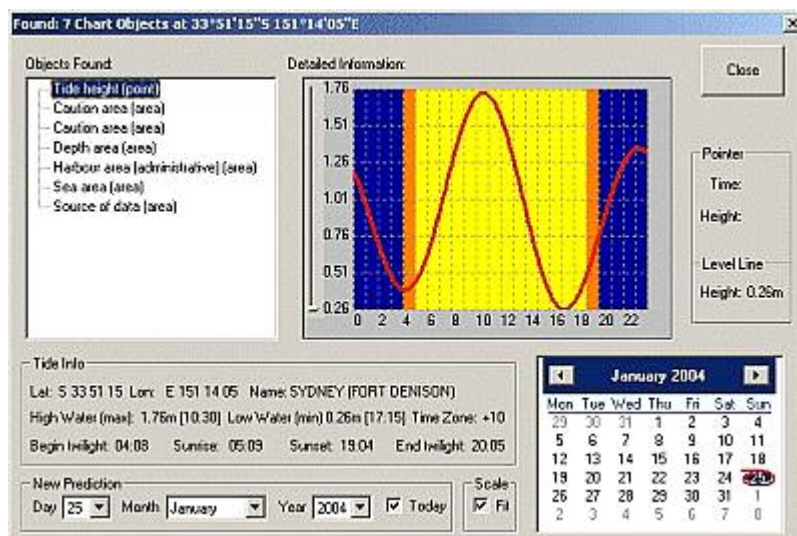


TIDE SYMBOL

If C-MAP Chart Level C or D is available in your portfolio, then the Tide symbol will appear in standard datum locations and can be right-clicked for comprehensive tide prediction information and graphs

Move the mouse cursor over the graph to view the tide height for any particular time.

Slide the "Level Line" marker on the left side of the chart to find safe water depths for your area.





OBJECT INFO

Depress OI, sets a quasi right-click mode, the next chart touch (or click with the left-mouse button) will perform a detailed "All information at cursor" search (as shown pictured above). This is equivalent to right-clicking AT ANY TIME on the chart.

Also in OI mode, a **QuickInfo** box will appear whenever the mouse pointer becomes stationary over a location with a data symbol beneath it (light, buoy, rock, wreck, etc).

Sample **QuickInfo** Box showing the data for Sydney Harbour's Macquarie Lighthouse.

MACQUARIE'
Tr W
Fl(2)W.10s105m25M

As all navigators should know (?) it means:

White Tower, with a white flashing light,
twice every 10 seconds.

The light is 105 metres above sea level and
is visible for 25 Nautical Miles in ideal conditions!

Other actions possible when **OI** mode is selected:



Lock-down the **CentreShip** button will keep the **Ship's Target** always visible on the display. If the ship is about to "sail off" the computer screen, the chart will re-position itself to keep the Ship's Target visible. The charts may change to a less detailed level when re-positioning if no detailed levels are available for this location.



Press the **Route Tool** button when in **OI** mode to display the **AllRoutes** form.



Press the **Waypoint Tool** button when in **OI** mode to display the **AllWaypoints** form.



RANGE AND BEARING LINES (RBL)

Use the RBLs to easily find the distance and direction between any two points. Press the button, then click on the two points of interest. Each point will also connect back to the ship, these extra RBLs may, or may not, be of interest to the operation.

Touching the chart will draw an RBL from Ship's Target to the mouse position, consecutive Touches will extend the RBL. Up to five extensions can be drawn, then the RBL will restart.

While the RBL is being drawn, each new point will draw from the previous point AND to the Ship's Target. After the next chart refresh, only the start and end points of the RBL will connect back to the Ship's Target.

Manually restart the Range & Bearing Line by pressing the RBL toolbar button twice (ie: Turn-Off RBL mode, then Turn-On RBL mode again).

The RBL's have a short life span, whenever the RBL button is depressed the current RBL is cleared and a new RBL is started. So to remove the RBL from the chart: enter RBL mode (press button), then exit RBL mode.

PAST TRACK

...see also [Power Users Chapter](#)

**The functionality of SOB's PastTrack features
are severely restricted
if SOB has not been Unlocked.**

About 5 times every minute, SOB will drop a dot on the chart display at your position, every 10 of these markers (sometimes known as the fabled "bread crumb") will be double-sized.

The colour of the **PastTrack** "crumbs" depends upon the navigation mode. Log **file replay mode** will show a red PastTrack, while **dead reckoning mode** will show a grey coloured PastTrack. Real-time navigating mode with an active GPS will show black dots with the double-sized dots highlighted.

Selectively display or hide the Ship's past track with a checkbox on the **Setup Ship** form. This form contains buttons for clearing, saving and converting the displayed track.

When SOB exits, the current on-screen PastTrack will be logged to two different files:

!PastTrack.txt will be appended with any unlogged points from the current session.
This file will continue to grow until deleted or renamed.
The data in this file is designed to be thoroughly analysed with Excel.

...see [Power Users - Analyse your Voyage](#)

!LastTrack.trk will be created to temporarily hold the current PastTrack, this track will be redisplayed in SOB when next started.

At any time you can convert your displayed PastTrack to a Route, using a button on the **Setup Ship** or **AllRoutes** form, only the large dots are used when converting to a route.

SOB also automatically converts any unlogged PastTracks to a Route (named **PastTrack00x.rte**) and saves it to the Routes folder when SOB exits. This PastTrack Route will NOT be created if there is less than 20 minutes of data (running time).

MAKING SOB "COME ALIVE"

Dead Reckoning

Click the Ship's Target (or press the [F9] function key) to display the Setup Ship's Position form, then check Dead Reckoning, enter your estimated (or measured) course and speed to "animate" SOB into movement. Any Route can be loaded (or drawn), then "dry-runned" while in DR mode. The Route can be **Activated** and course and speed manually changed as necessary to simulate this voyage. The **Destination ViewPanel** will display data based upon the DR settings.

Voyage Replay

Double-click the chart surface to display the Raw NMEA Data form. Press the button to replay a pre-recorded NMEA log file.

See also [Power Users - Logfiles](#) and [Technical Information - Logfiles Folder](#)

Real-Time Navigation

Just plug any NMEA compatible positioning device (typically a GPS) into your computer's serial port, and watch the Ship's Target move around the chart with pinpoint accuracy.

NAVIGATING TO A DESTINATION (N2D)

... see also [Advanced Tools](#)

SOB will automatically provide extra information in a **ViewPanel** whenever a **Navigate to Destination** scenario is active.

SOB must be set to one of these three **N2D** conditions before AutoPilot output is enabled. To completely enable AutoPilot control, the AutoPilot must also be set to "Remote Data" (...or similar – consult your AutoPilot manual for instructions on how to set this), NMEA sentences for controlling the AutoPilot must also be ticked on the **Raw NMEA Form** (double-click the chart surface to display this form).



In N2D mode, a red "Destination" Information Panel will show all necessary data to help you navigate to your destination - be it a Man-Over-Board position; specific Waypoint; or next Turn Point in the Active Route.

There are three **N2D** scenarios in SOB. In order of priority they are:

1. **Man-Over-Board**
Enabled by pressing the MOB button.
2. **Navigate to Destination Waypoint**
Any waypoint can be set as a destination, by pressing the "Navigate to..." button on it's [Waypoint Form](#). Also, for a destination waypoint, an "Arrival Zone Alarm" can be set. The arrival zone will appear on the chart as a **red** "hashed" circle around the destination waypoint.
3. **Next Turn Mark on an Active Route**
If neither (1) nor (2) apply, AND a Route is currently marked as active, then the Destination panel will show details pertaining to the next turning point on the Active Route (press the "Activate" button on the [Route Form](#)).
The active route is displayed on the chart as thick **red** lines, any passed TurnMark is drawn as a **green** dot with the next TurnMark shown as a **yellow** dot. The current leg and the Destination ViewPanel is automatically updated as the turn marks are passed (either by sailing within the arrival zone, or passing a "perpendicular" from your course to the mark).

TTG & ETA on this Destination ViewPanel are calculated based on **VMG** (Velocity Made Good).
VMG represents that component of your speed and heading which is actually helping you get to the destination. If VMG is negative, then you are receding from your destination (getting farther away).



ROUTES

... see also [AllRoutes Form](#) and [Advanced Tools - Active Route](#)

Drawing, Editing and Activating Routes

Create a new Route: Start Route mode by pressing the [Route] button, consecutively Touching chart will place the Starting-Mark, Turning-Marks and Destination positions.

Select a Route: Touch any route TurnMark to select that route, the route will change colour to red to show it is selected. The currently selected TurnMark, will become a large solid dot, the next mark along the route will be a large hollow dot.

Edit a Route: The Route/mark must first be selected, then Touch the new location to move the mark. (Hint: if the old mark is in the way when moving, first move to a different location, then move back)



Touch the same Route TurnMark twice to pop-up the Route Button Menu.

Insert Route TurnMark: Touch a mark twice, pressing the [Insert a TurnMark] button will place a new mark after the selected one. Move the new mark to its desired location.

Delete a TurnMark: Touch the mark twice, then press the [Delete a TurnMark] button.

Display Route Details Form: Touch any route turn-mark to select it, then Touch it again and press [Route Details] on the button menu.

Activate a Route: by depressing the button on a Route Form.

...also refer to [Advanced Tools - Active Route](#)

Load a Route from file: Display the Route Data Form then press the [Load...] button, or use the AllRoutes form for loading and unloading displayed Routes.

All routes used during a SOB session are automatically saved when the program exits, the route name is used for the file name. To delete one of these routes, simply delete the file name using Windows™ File Explorer. Existing Route files will be saved to the **\SOB\Routes\archived** folder before being over-written.

...see also [AllRoutes Form](#) for comprehensive Route File management features

GreatCircle Route Legs & "Composite" Sailings

Great Circles (orthodromic curves) are defined (mathematically) as the intersection of a sphere and a plane passing through its centre. But for purposes of navigation, only two things need be known: (1) Great circle courses are the shortest distances between two points on the Earth's surface; and (2) on a Mercator's Chart, great circle courses are NOT straight lines.

The alternative to Great Circles are **Rhumb Lines** (loxodromic curves). Rhumb line courses on a Mercator's chart ARE straight lines. Rhumb lines are followed by maintaining a constant heading, whereas to follow a great circle course, one must continuously change the ship's direction.

Further: Lines of longitude are Great Circles, lines of latitude are NOT (except for the Equator) – refer back to the mathematical definition given above.

For practical purposes in navigation, distances less than 200nm and courses North or South gain little benefit from using great circle courses.

Composite Routes are a combination of Rhumb Line and Great Circle legs. Typically created to avoid land masses or iceberg regions on great circle courses. In the Composite Route example that follows, a Rhumb Line course is used to avoid sailing further north than 48° latitude in the Great Circle leg.

In SOB, as in all forms of manual navigation, pure Great Circle legs are actually substituted with a series of linked rhumb lines to form an "almost" continuous curve.

Example: Great Circles, Rhumb Lines and Composite Routes

The following example demonstrates how to convert a **Route leg** to a **Great Circle**, then back to a **Rhumb Line**. The result being creation of a **Composite** course:

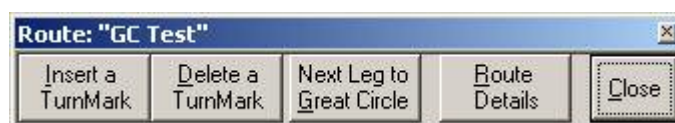
Step 1: Create the start and end points of the route:

Start point: Japan; end point: USA West Coast



Step 2: Convert the Rhumb Line Route leg to a Great Circle course:

Now click the start point twice to display the Route tool button bar. Because the Route point selected is part of a Rhumb Line leg (by default), the middle button displays: [Next Leg to Great Circle]

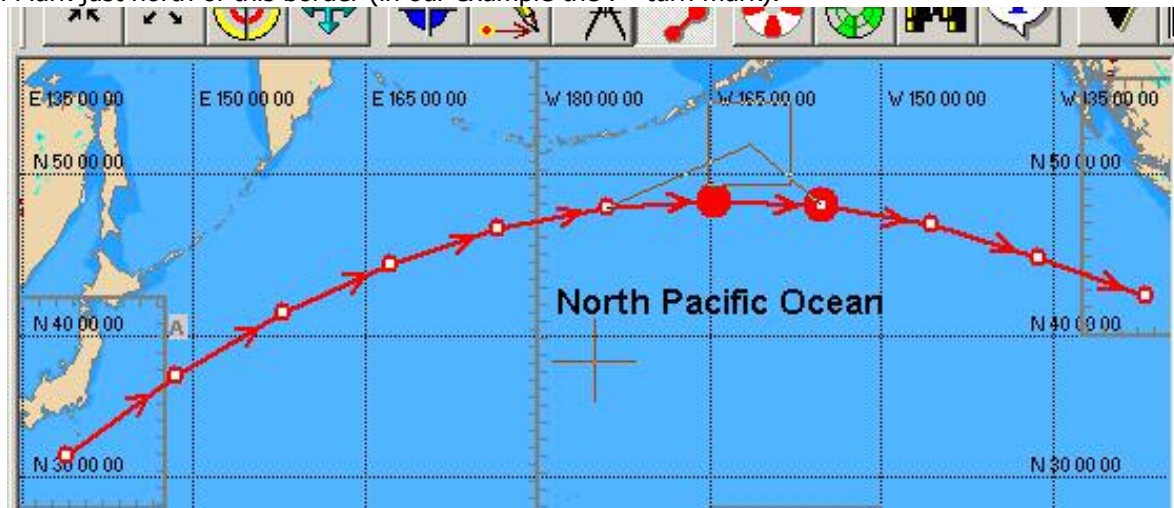


Press this button [Next Leg to Great Circle] to convert the Rhumb Line leg into a series of shorter linked Rhumb Lines that overall will represent a Great Circle:



Step 3: Convert part of the leg north of 48° back to a Rhumb Line:

The second part of this example states that we don't want to sail north of 48° latitude. So select the first Turn Mark just north of this border (in our example the 7th turn mark).



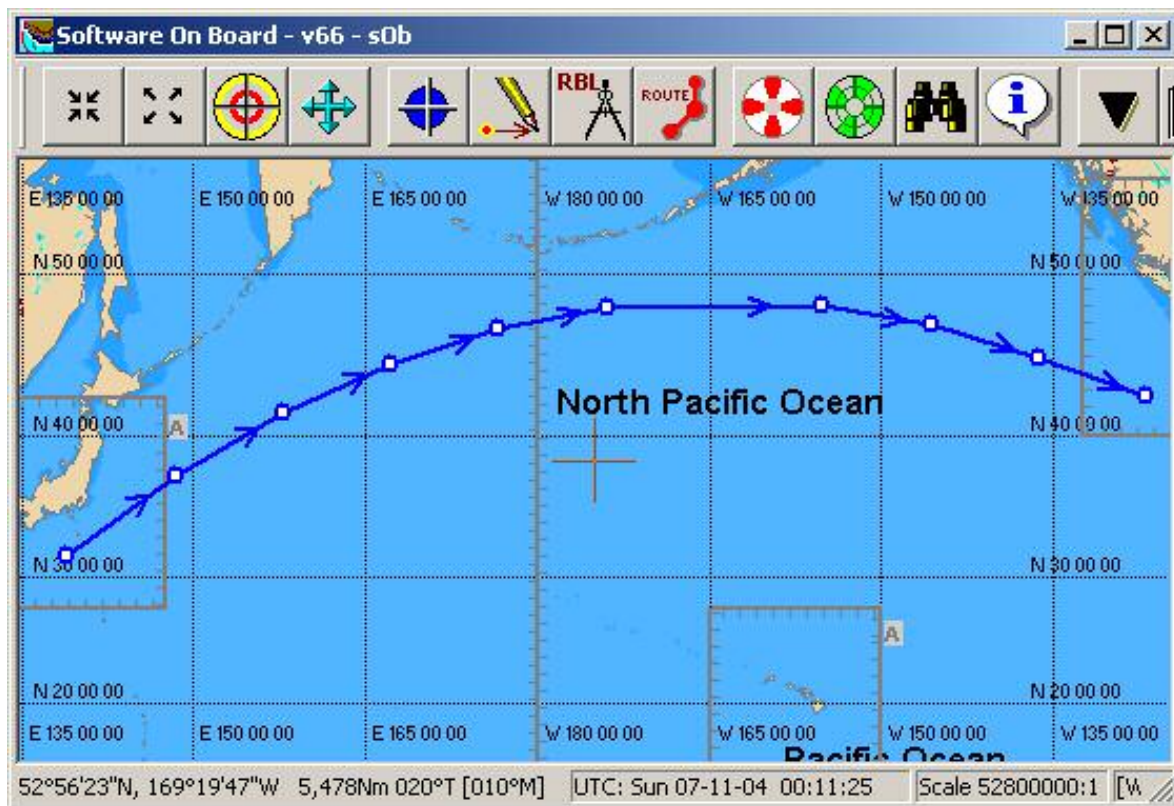
Then click the same mark again to display the button menu:



Notice that this time the centre button has changed to [GC Leg to Rhumb Line]. SOB knows that this turn mark is part of a Great Circle leg, so the button menu provides the choice to convert the great circle from this point onwards back into a Rhumb Line, automatically deleting each GC turn mark that was created in Step 1, up to, but not including the final point.

However, for this example it is easiest to just delete the single turn mark lying north of the 48th parallel.

The resultant **Composite** Route is pictured here:



The Route thus created can be manipulated as for any other Route and turn marks can be:

- deleted
- inserted
- moved
- activated
- etc...

You may notice the total Route length was 4,551 Nm for the Rhumb Line and became 4,322 Nm for the GreatCircle/Composite equivalent. A saving of 229 nautical miles or 424 kilometres.



WAYPOINTS FORM

...see also [Quick Start Chapter](#)

Name

Change the name of the Waypoint at any time, be sure to save this change by exiting the form with the **[Close]** button.

Any name is suitable for use with SOB, however it's worth being aware that if transferring Waypoints between different systems (eg: the GPS, C-MAP User Card, other Nav Programs) there may be limitations as to what characters are allowed, and how many characters are permitted. For instance, most GPS units will only accept 6 letter names for waypoints.

Distance, Heading and Time Data

The data displayed at the top of the form provides detailed information about the location of the waypoint relative to the Ship's Position.

Notice that the "Heading to Wpt", and "Bearing from Wpt" are reciprocals (ie: same course but opposite directions). And these angles are given as **True** compass values.

The **SOG** is Speed-Over-Ground supplied by the GPS. **SPD** is the Boat-Speed across the water as supplied by a speed LOG device (if connected).

Velocity-Made-Good (or **VMG**) is that component of your speed that is actually helping you make ground towards the waypoint. If heading directly to the Waypoint, then VMG = SOG (ie: 100%); if heading away from the Waypoint, then VMG will be ZERO or have a negative value. According to Pythagoras and trigonometry, the VMG for other headings will be calculated appropriately.

Storage

Temporary waypoints are set if the "Save Wpt when SOB exits" checkbox is not ticked, ie: the Waypoint will exist only while SOB is running.

To keep this waypoint in the **!default.wpt** file to automatically load when SOB starts, ensure that this box is ticked. All waypoints in the **!default.wpt** file will be loaded when SOB starts.

If the waypoint is not marked as "Autoload Wpt when SOB next starts", then the waypoint will still be loaded, however, it will be drawn hidden (the **[Show/Hide]** button will be "up") and appear as a small "dashed" circle on the display. This waypoint can be selected in the normal way (select the **Waypoint Tool**) and its setting changed if you desire.

... see also **AllWaypoints** form in this chapter.

Navigate to Destination (N2D)

...see also [Easy Tools - N2D](#) and [Advanced Tools - N2D](#)

Press this button to set the Waypoint as a **Destination** waypoint. Only one waypoint will be a nominated **Destination** at one time, although other Waypoints can have this button pressed.

SOB will set THE FIRST SEQUENTIAL WPT as the **Destination**. Once this waypoint has been arrived at (see Arrival Zone next), its status as a **Destination** will be automatically reset. If any other waypoints are nominated as **Destinations** then the NEXT SEQUENTIAL WPT will become the new active **Destination**.

Note: SOB will automatically use the next, and any subsequent, **Destination** waypoints as each previous destination Waypoint is passed. ...see the example of this: [Advanced Tools - Waypoints as Destinations](#)

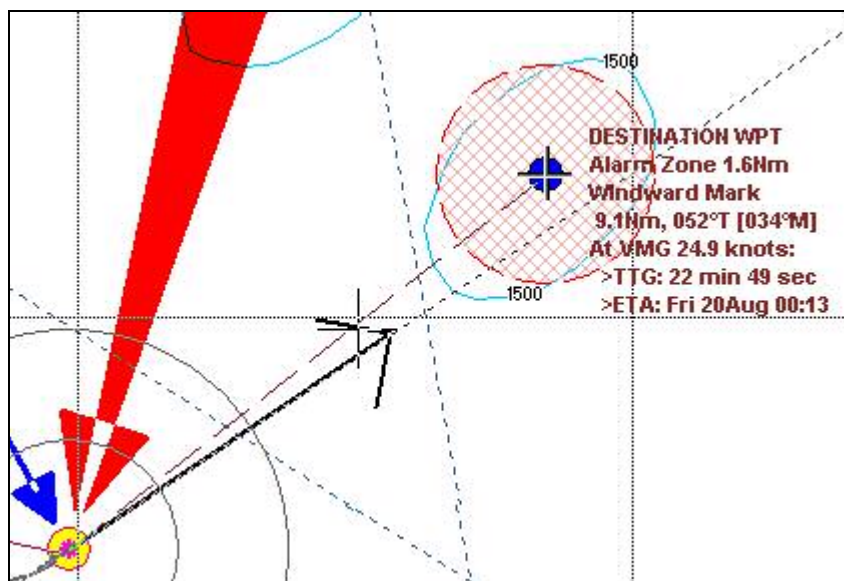
The Waypoint sequence is determined by the order in which they were created. This order can be seen in the Loaded Waypoints Listing on the [AllWaypoints](#) form.

Destination Waypoints are easily recognised on the chart as they have additional text in the Waypoint Label (see picture below for example).

Arrival/Anchor Zones

The **[Alarm]** button and **Radius** textbox serve a dual purpose:

1. as an **ArrivalZone** circle when the Waypoint is used as a **Destination**. A hashed circle is drawn around the Waypoint marker (pictured below). When the ship breaches this **ArrivalZone**, SOB will emit a buzzing alarm and log the alarm event to the **Messages ViewPanel**.
2. if the waypoint is NOT set as a Destination, then the **[Alarm]** button will set an **AnchorZone** alarm to the size nominated in the **radius** box. Again, the AnchorZone circle will be shown hashed on the chart, and the buzzing alarm will sound and the event logged, if the Ship moves outside the zone.



New Position

Manually move the Waypoint to a different location by entering the Latitude and Longitude directly, then press the [Set] button. The coordinates can be entered in any of the three standard formats:

Format	Example	Also accepted	
Degrees-Decimal	±DD.dddd°	±DD.dddd	12.345E
Degrees decimal-Minutes	±DD°MM.mmm'	±DD MM.mmm'	12 34.56'N
		±DD MM.mmm	12 34.56W
Degrees-Minutes-Seconds	±DD°MM'SS"	±DD MM'SS"	12 34'56"S

Notes: Use a space or degree symbol (°) for the whole degrees. Use the single-quote mark (') for minutes, and the double-quote mark (") for seconds. Use a preceding minus sign, or dash (-) to indicate South or West, or use a trailing quadrant letter ie: N,S,E or W. The degree symbol (°) can be entered using the keyboard by holding down the **Alt** key, typing **0176** on the numeric keypad then releasing the Alt key.

Label & Style

Set these to customise the appearance of the Waypoint symbol, and its accompanying text.

The size of the Waypoint's label text will change along with the **Small, Medium, Large** settings for the Waypoint style.

Wind Shadow

See [Advanced Chapter - Wind Tools](#)



MAN-OVER-BOARD (AKA MOB)

A Man-Over-Board marker is a regular **Waypoint** placed at the **Ship's Position** with the following properties set:

- Name is "MOB"
- [Navigate to Destination] set to ON
- [Alarm] turned ON
- ArrivalZone circle radius set to 50 metres
- RNG/BRG and TTG/ETA label enabled
- Style set to: Small, crossed, red circle
- Notes: UTC at time of setting MOB mode
- In addition, on the **Setup Ship's Position** form, the **CourseLine** is turned ON.

The MOB tool should also be used if you want to place a Waypoint at your current exact position (for instance: if at anchor, or positioned over a dive wreck, etc).

If not being used as a Destination, then this should be disabled at the first opportunity. Note though that the **Waypoint Tool** will be unable to select this waypoint until the ship moves off it, as the Ships Form will always appear first when clicked with any tool selected. The ship can be manually (temporarily) moved off the waypoint by clicking on the chart where you'd like the ship moved to, then press [F9] or click the Ship's Target to display the Ships Form, then press the [Set] button to move the Ship's Target. (You may need to temporarily turn off or unplug the GPS to prevent it from moving the Ship back).

With the Ship's Target separated from the Waypoint, it is now possible to select and alter the Waypoint's settings by clicking it with the Waypoint Tool selected.



ALLWAYPOINTS FORM

All Waypoints

External Waypoint Source

☒ GPS ☐ C-MAP User Card

[7] GPS Wpts Re-Start Capture

Name	Lat	Lng
1.000	-33°38.17'	151°17.64'
2.MISSED	-33°38.52'	151°18.23'
3.BASIN	-33°35.92'	151°18.23'
4.WEST...	-33°34.49'	151°18.74'
5.FLINT	-33°34.18'	151°17.09'
6.REFUGE	-33°35.31'	151°14.88'
7.IDLETM	-33°35.98'	151°14.78'

<< === >> >>>

Waypoints in Current SOB Session

Waypoint files

Name	Wpts	Loaded
!default.wpt	-	---
Aus E. Coast Anchorage...	-	---
GPS001(2004-07-09).wpt	-	---
Hbr Arrival.wpt	2	yes
Hbr Departure.WPT	-	---
Old GPS Export.txt	??	raw
Sth Pacific DiveSites.csv	??	raw
TEST2.WPT	2	yes

Nothing Selected

All loaded Waypoints

Name	Lat	Lng
New 2	25°00'00"S	179°00'00"E
2.MISSED	33°38'31"S	151°18'14"E

Nothing Selected

☐ Save in Default Waypoint File

Save to File...

Conversions Keyboard Export Cancel OK

With the **AllWaypoints** form, it is possible to:

- Load/Unload and Manage Groups of Waypoints stored in SOB ".WPT" files
- Automatically import and convert ".TXT" or ".CSV" files to ".WPT" files
- Capture Waypoints from GPS into a ".WPT" file
- Export a ".WPT" file to a ".CSV" file
- Nominate individual or groups of Waypoints to be automatically loaded when SOB starts
- Save specific waypoints to their own file
- Delete waypoints from own files or current SOB session

Note: Waypoint files will be saved to the **SOB\Waypoints\archived** folder before being over-written.

Using the **USB Card Reader**, SOB can read any correctly formatted files (as per C-MAP specifications) saved to the **C-MAP User Card** by a compatible chartplotter.

SOB can read Waypoint, Track, Route files from the UserCard and convert them to text lists or SOB PastTracks, Routes or Waypoint files.



ALLROUTES FORM

All Routes

Route Files Change Folder ...

Name	##
Auckland to Fiji.rte	
Berimilla Pittwater-Harbour...	
Cook.rte	
Fiji to New Cal.rte	
NZ to Fiji.rte	
Panama Canal.rte	
PastTrack001(2004-08-0...	
PastTrack001(2004-08-0...	
PastTrack001(2004-08-1...	

GPS Routes Stop Capture

ROUTE [7]
[5] WPL - 000,IDLETM,REFUGE,FLIN

Loaded Routes in Current SOB Session

Name	TMs	idx
Auckland to Fiji	8	1
Fiji to New Cal	16	2

Route Options

Auckland to Fiji

Labels

Detail Sample Label
104Nm 084°T
TTG 2h34min

Legs

Width Default Leg Speed
2 10 knots
☒ Draw Arrows

TurnMark Arrival Zone

Arrival Circle Radius 20 (metres)

Activate Reverse

Unload 1 selected Routes

Convert PastTrack to Route ... Create AutoRoutes ... Keyboard Cancel OK

AllRoutes form with Import/Export facilities from any drive, folder, file.

- Maximum number of Routes that can be loaded in a SOB Session = 30
- Load/Unload Routes into current SOB session.
- Routes can be "Reversed"
- Auto Search Route creation
- Create Route from PastTrack
- Capture Routes from GPS (GPS must output **RTE** and **WPL** NMEA Sentences)
- Convert PastTrack and GPS NMEA messages (RTE/WPL) to a Route
- Routes are easily transferred between computers (either email as an attachment, or save to disk), just place the file in the Routes folder, then load it as described above.

A simple conversion macro is available to convert routes from the CMAPECS program (used with the CM93 charts) to SOB format. Please contact support@digiboat.com.au and request this program.

<< [Quick Start Page](#) | [Manual Index](#) | [C-MAP Charts Page](#) >>

C-MAP CHARTS

- Night Mode
- C-MAP's NT/PC Chart Selector program
- Compatible Chart Types
- Using NT+ Cartridges and the USB Card Reader
- Using the C-MAP User Card
- C-MAP Chart Legend

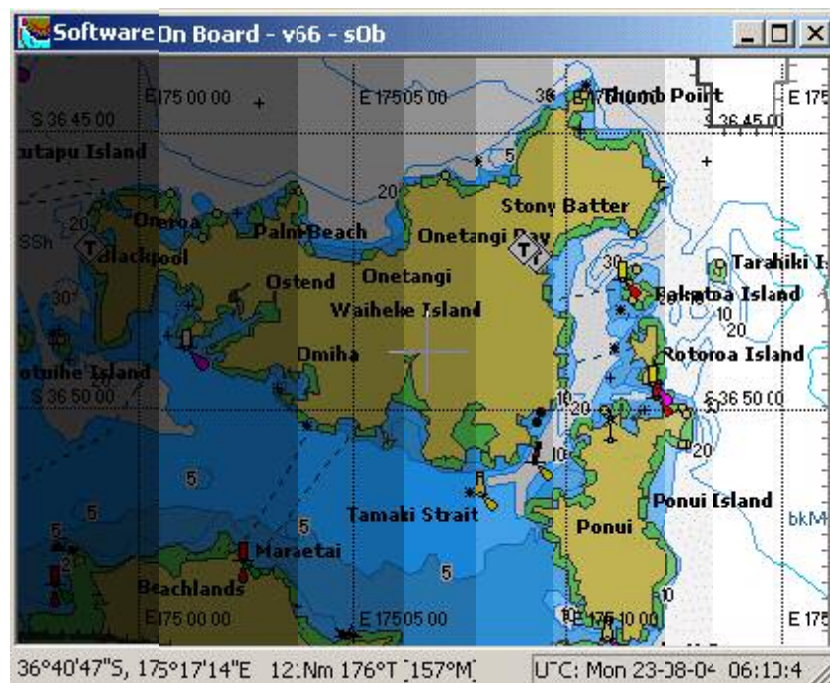
NIGHT MODE & DISPLAY PALETTES [F7] & [F4]

Use the **[F4]** function key to scroll through different chart display "palette" choices. Several palettes are possible, including High Contrast Green & Black, Grey Scale, CM93 chart colours, Pale colours, and Deep colours.

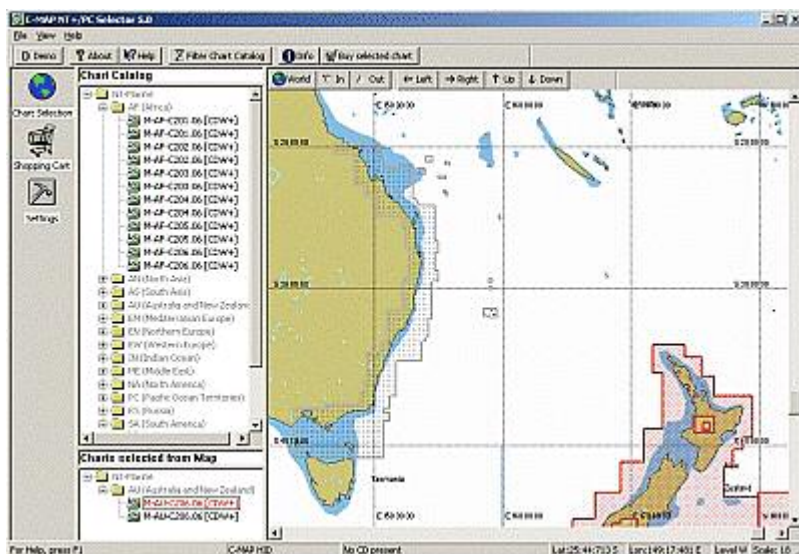
The different palettes should improve visibility under certain conditions and with particular display types. eg: to enhance visibility of the Navigation tools (as opposed to the chart display) the Grey-Scale palette can provide good contrasting from a grey chart to the full colour SOB tools; or certain LCD colour screens work well with the Deep-colour palette; etc.

The **[F7]** function key cycles through a range of bright-to-dim screen luminescence. Select a bright one for daylight navigating, or darken the display for dawn, dusk or night-time navigating.

The split graphic of a SOB Window (below) shows the various night shading that is available by continuous pressing of the **[F7]** function key.



C-MAP's "NT/PC CHART SELECTOR" PROGRAM



The **NT+/PC Selector** program supplied on the C-MAP Chart CD-ROM disks as an auto-installing application.

C-MAP NT+/PC Chart Selector program is auto-installed from the C-MAP CD-ROM disks.

This program allows you to easily examine, and price, the chart regions available for your area. Simply click on the chart for your area to see a red-bounding-box appear to indicate the coverage area. Any grey-bounding-boxes on this display indicate regions that you have already purchased.

Fine-tune your selected area using the alternate chart portfolios listed in the **Charts selected from Map** window. Generally, a certain area will be covered by both **Wide+** and **Superwide+** chart portfolios.

If you have internet connection, you can immediately continue with the **Shopping Cart** and purchase a **Licence Code** for your selected chart via the in-built online shopping, or use the **call centre** option to purchase your charts via the telephone.

Also use the **Selector** program to back-up and restore all C-MAP chart **Licence Codes** that have been purchased.

These Licence Codes can then be backed-up to CD-RW or transferred to another computer for use if you have a **C-MAP USB Key**.

To transfer your Licenced chart codes to other computers, use the **Selector** program to back-up the codes, then (using a floppy disk, CD-RW or USB drive, etc) restore them onto the other computer(s).

SOB will automatically display any licenced charts providing they have been successfully restored, and the USB Key is inserted when SOB starts up.



The **C-MAP USB Key** (or **Dongle**) allows your purchased C-MAP Charts to be used on any computer that has this Key plugged in.

C-MAP CHART TYPES COMPATIBLE WITH SOB

The C-MAP Charts are available on CD-ROM or on the NT+ Cartridges.
Either of these charts, indeed both in combination, are suitable for use in SOB.



C-MAP NT+ /PC Charts (CD-ROM version)

The CDs containing all the World's C-MAP charts are given away freely by C-MAP (registered SOB users had the option of having these disks posted to them at the time of registering, otherwise they can be ordered direct from C-MAP at any time).

Specific charts on the CDs must be selected and licenced prior to use. A simple program **NT/PC Selector** is included on the C-MAP CDs to allow easy chart selection and immediate on-line or call-centre ordering. C-MAP will only supply you with a Licence Code which will unlock the purchased chart allowing SOB full access to it.



NT+ C-MAP Cartridges

Commonly used in chart-plotters from a variety of manufacturers, these cartridges can also be used by SOB on your computer. An accessory, supplied by C-MAP, is the **USB C-CARD Reader** which connects to your computer via a USB port, and will permit use of any NT+ C-MAP Cartridge within SOB.

The Card Reader can take two C-MAP cards at one time, and further chart cards can be "hot-swapped" without the need to close or re-start SOB.



What about CM93 charts, do they work?

CM-93 format charts are now very old and have been superseded by the **NT+** (cartridges) and **NT/PC** (computer CDs) format C-MAP charts. Most C-MAP offices have generous upgrade offers available, please discuss your options and pricing with www.c-map.com.

SOB uses the absolute latest version of C-MAP charts, the **NT+** and **NT+/PC** formats, and is not compatible with the CM93 format.

USING C-MAP NT+ CARTRIDGES & USB CARD READER

... see also [Quick Start Chapter](#), [C-MAP Charts](#) on website



NT+ C-MAP Cartridges

Commonly used in chart-plotters from a variety of manufacturers, these cartridges can also be used by SOB on your computer. An accessory, supplied by C-MAP, is the **USB C-CARD Reader** which connects to your computer via a USB port, and will permit use of any NT+ C-MAP Cartridges within SOB.

The **USB Card Reader** can take two C-MAP cards at one time, and further chart cards can be "hot-swapped" without the need to close or re-start SOB. The **USB Card Reader** is supplied with the C-MAP **NT Planner** program, or can be purchased separately from your local C-MAP Office - www.c-map.com

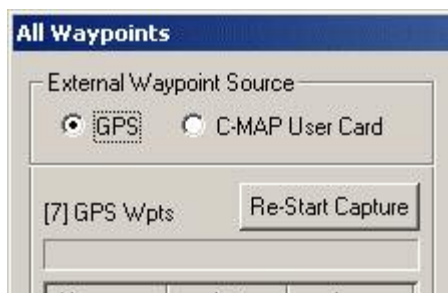
Reading and Writing to a C-MAP User Card



The C-MAP UserCard is a digital memory storage device (or cartridge) sold by C-MAP. The cartridge is the same type used for distribution of C-MAP NT+ Charts for use in ChartPlotters, however the UserCards are blank, and designed to be used in a manner similar to floppy disks.

They are used for the backup or transfer of any user marks, events, routes and tracks that have been drawn on the chartplotter.

Using the UserCard, it should be possible to transfer Waypoints, Routes and Tracks between SOB, PC Planner and C-MAP compatible chartplotters.



The interface for using the C-MAP UserCard is on SOB's **AllWaypoints** form [F10].

Select the **C-MAP User Card** option at the top of the form to show a list of all files on the UserCard.

Any files corresponding to C-MAP's standard file format for saving marks, events, routes and tracks can be imported by SOB.

Several different combinations are possible:

- Events/Marks > SOB Waypoints
- Tracks > SOB Track or Route
- Routes > SOB waypoint file or route

C-MAP CHART LEGEND

C-MAP Cartography - Detailed C-MAP Information

WebLink: http://www.digiboat.com.au/downloads/c-map_cartography.pdf

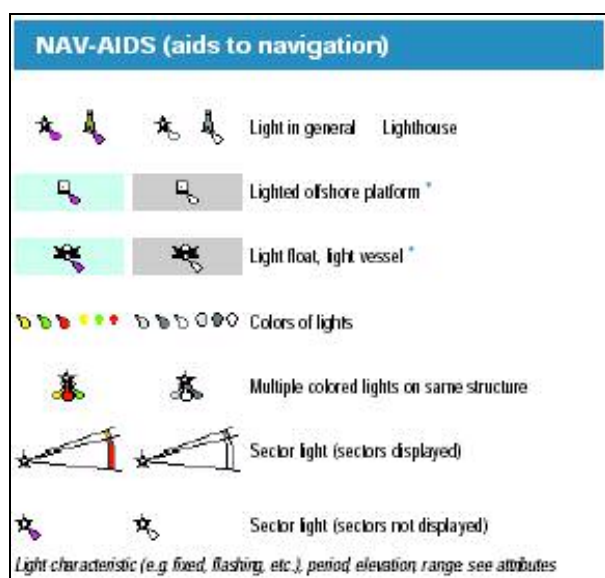
This is quite a large (3.5Mb) and detailed, single A3 page, colour PDF file. Suited best to be printed at A3 size, it can also be printed across two A4 pages, however your print driver or PDF program must support this feature.

This file contains general information about C-MAP Electronic Charts and specific detail about chart coverage types and C-MAP media, etc.

Although none of this information is necessary to use SOB, it nevertheless is relevant and interesting.

C-MAP Chart Legend - List of all Chart Symbols

WebLink: http://www.digiboat.com.au/downloads/c-map_chart_legend.pdf

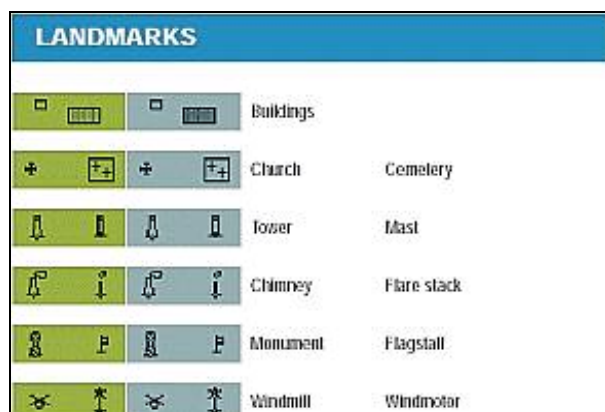


Excerpts from the **C-MAP Chart Legend** PDF file:

All symbols, features, marine and ports detail displayed on the charts are listed on this **C-MAP Legend** sheet.

A few sample cut-outs are included in the images at left and below.

We recommend that you print out this PDF file and keep it near the chart table (ie: computer table). This single page file can be tricky to print, ideally your printer should be able to print A3 size, or print a single page tiled across 2 pages.



SEABED TYPE	
M Mud	Vol Ash Volcanic ash
Cy Clay	K Kelp
Si Silt	Grs Grass
S Sand	Stg Sea-tangle
St Stone	Spi Spicules
G Gravel	Cir Cirripedia
P Pebbles	Fu Fucus
Cb Cobbles	Ma Mattes
R Rock	S Co Sabellaria
Lv Lava	S Bk Sandbank

ADVANCED TOOLS

- The Chart Toolbars
- Route Details Form
- N2D - Navigating to a Destination
- Waypoints as Destinations
- Active Routes
- Wind Tools
- AutoPilots
- Auto-Search Routes
- NMEA Raw data Form

THE CHART SETTINGS TOOLBARS

Chart Levels Toolbar [F2]



Particular Chart Levels can be quickly selected using these toggle buttons. They will automatically toggle while SOB is being zoomed using any other methods to indicate the current displayed Chart Level. (This will always be the same as the chart level reported on the Status Bar - see next section).

The Levels equate to the following scale ranges:

Background Levels

W	26,400,000	General Continental and National scales
X	13,200,000	
Y	8,800,000	
Z	6,600,000	

Levels for Navigating

A	1,500,000 : 5,000,000	World scale
B	500,000 : 1,500,000	General nautical scale
C	150,000 : 500,000	Coastal scale
D	50,000 : 150,000	Intermediate coastal / approach scale
E	15,000 : 50,000	Approach scale
F	5,000 : 15,000	Harbour scale
G	1,500 : 5,000	Plan scale

Virtual Levels

H	500 : 1,500	Over-zoomed scales for close-up mathematics and calculations
I	150 : 500	
J	50 : 150	

Chart Toggles Toolbar [F3]



ChartLock

only allows panning to an existing chart. Will move up levels (to less detailed) until the first with data is found whenever the screen is panned into a "grey" area (ie: no coverage on current level).

OverZoom

should always be ON for most chart configurations and chart usage.

SkipEmptyLevels

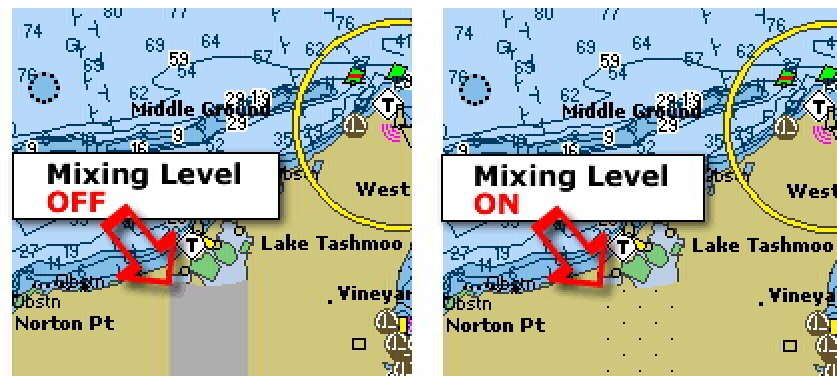
will display only levels that exist when zooming - should also be ON for most usage.

VirtualCharts

allow unlimited zooming – but to "course scale" charts at times (ie: heavily over-zoomed), typically useful for accurate calculations and measurements.

MixLevels

can be slow on weaker computers, however aesthetically useful for avoiding the "grey" areas by drawing the previous available level as a "fill". Be aware that charts of different creation scales will be side-by-side, the larger scale chart will be less accurate and not always line-up precisely with the more detailed chart. The less detailed mixed levels are shown with a dotted pattern, as pictured...



Tides & Currents

show/hide these symbols on the chart

Sea Bed

display abbreviated codes for type of Sea Bed (eg: Mud, Clay, Silt, Sand etc)

Depth Soundings

show/hide display of depth markers on contour lines, and inter-use with the [F5] key to toggle display of Spot Soundings (where charted).

Bounding Boxes

show a grey-outline around areas where more detailed charts are available

Graticule

show/hide the lines of Latitude and Longitude

NAVIGATING TO A DESTINATION (N2D)



In N2D mode, a red "Destination" Information Panel will show all necessary data to help you navigate to your destination - be it a Man-Over-Board position; specific Waypoint; or next Turn Point in the Active Route.

SOB will automatically provide extra information in a **ViewPanel** whenever a **Navigate to Destination** scenario is active.

There are three such scenarios in SOB. In order of priority they are:

Man-Over-Board

Enabled by pressing the MOB button.

Navigate to Destination Waypoint

Any waypoint can be set as a destination, by pressing the "Navigate to..." button on its Waypoint Form. Also, for a destination waypoint, an "Arrival Zone Alarm" can be set. The arrival zone will appear on the chart as a **red** "hashed" circle around the destination waypoint.

Next Turn Mark on an Active Route

If neither (1) nor (2) apply, AND a Route is currently marked as active, then the "Navigate to..." panel will show details pertaining to the next turning point on a Route if it is marked as **active** (press the "Activate" button on the Route Form).

The active route is displayed on the chart as thick **red** lines, any passed TurnMark is drawn as a **green** dot with the next TurnMark shown as a **yellow** dot. The current leg and the Destination ViewPanel is automatically updated as the turn marks are passed (either by sailing within the arrival zone, or passing a "perpendicular" from your course to the mark).

TTG & **ETA** on this Destination ViewPanel are calculated based on **VMG** (Velocity Made Good). VMG represents that component of your speed and heading which is actually helping you get to the destination. If VMG is negative, then you are receding from your destination (getting farther away).

AutoPilot control

An N2D scenario must be active before SOB will transmit NMEA control sentences to an AutoPilot. Select compatible NMEA commands to send with the **Raw NMEA Form**.



WAYPOINTS AS DESTINATIONS



Waypoints nominated as a Destination create a "Navigate to Destination" (N2D) scenario in SOB. Any N2D scenario (also a Man-Over-Board, or Active Route) will display the red N2D ViewPanel, providing constantly updated information to help you navigate to this location. The Waypoint text on the chart surface will also supply basic navigation information if enabled.

To make a Waypoint a destination, press the [Navigate to Destination] button on the **Waypoint Form**, the FIRST one found in the list, that is set as a destination waypoint, will be the one used for on-screen navigation. If this waypoint is consequently un-set then the next one found in the list set as a destination will be used, etc. The waypoint's status as a destination waypoint is reset once its ArrivalZone has been breached, or the [Navigate to...] button is reset.

NOTE: A Man-Over-Board is a regular Waypoint set as N2D.

Sequential Waypoints set as destinations can be used as a simple route, as illustrated by the following examples ...

Example 1 - A serious day's fishing...

Place Destination Waypoints sequentially along your intended course ...

<p>A fisherman might place a series of 6 Waypoints at the following locations:</p> <ol style="list-style-type: none"> 1. crab pot 1 2. abalone headland dive 3. crab pot 2 4. start trawling 5. stop trawling 6. back home 	<p>Set each as a destination waypoint, then once you reach each waypoint in turn, the "Arrived at ..." text will be printed in the Messages ViewPanel, the next waypoint is then used as the next destination, allowing you to take appropriate action...</p> <ol style="list-style-type: none"> 1. stop the boat to retrieve the crab pot 2. stop for the dive 3. stop the boat to retrieve the other crab pot 4. slow to 8 knots trawling speed 5. fast as possible back home 6. prepare mooring/berthing gear
--	--

Example 2 - Harbour entry/departure...

A sequence of rounding marks for entering or departing a harbour or river mouth.

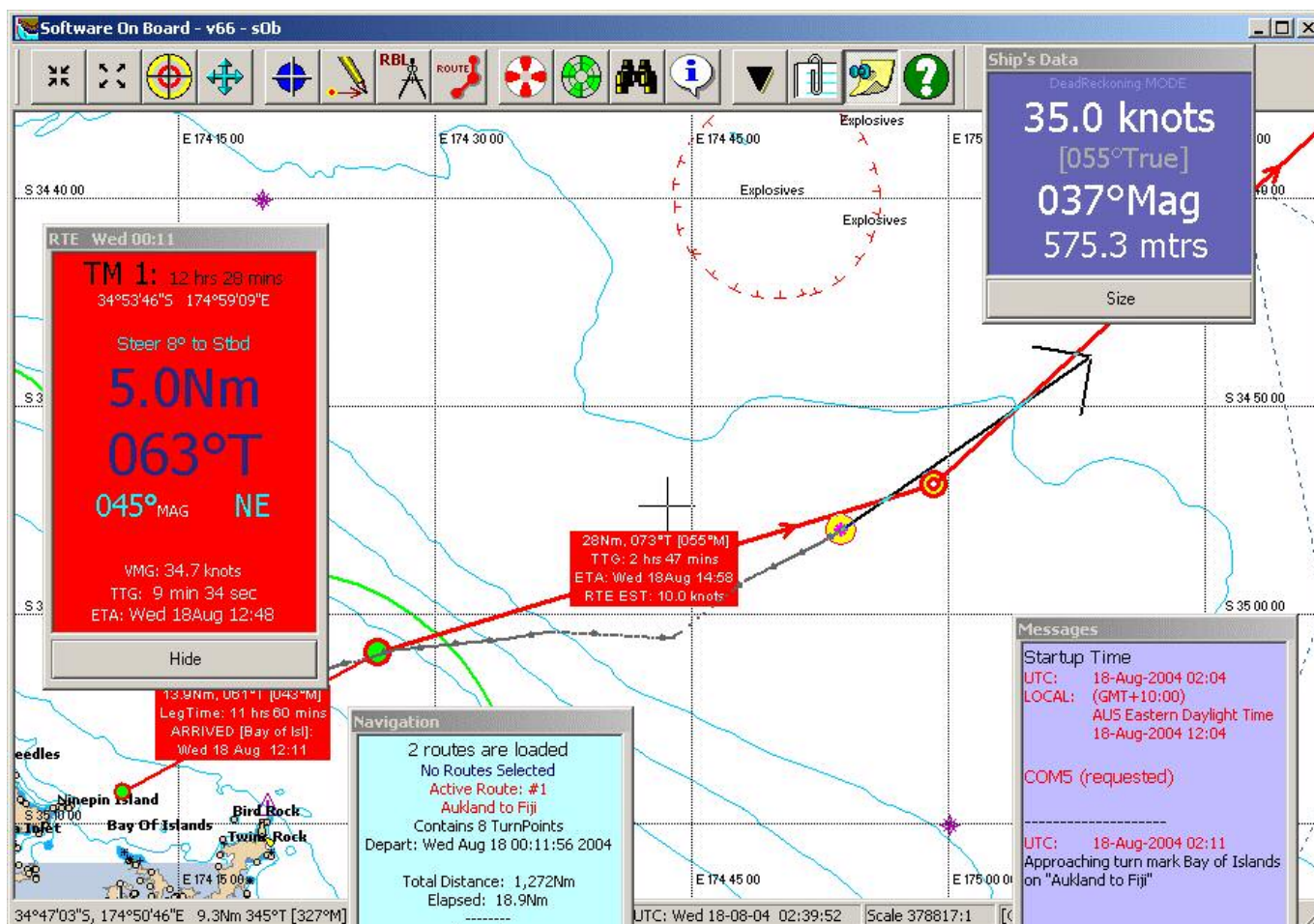
Two separate waypoint files would be constructed: "harbour-in.wpt" and "harbour-out.wpt". First, consecutively create waypoints for the IN file, then using the AllWaypoints form, save them to their own file. Repeat using a different sequence and (probably) different waypoints for the OUT file.

When creating the waypoints, mark each as a destination (and optionally set the ArrivalZone alarm and distance). Load and unload the appropriate waypoint file when entering or leaving your harbour.

If the waypoints were created in the correct order, the N2D panel will help to guide you to each one in turn.



ACTIVE ROUTES



Use this ScreenShot as reference for this Active Route example.

To activate a Route, it must first be drawn on the chart, or loaded from a file. (Refer to the QuickStart card for instructions on drawing or loading a Route).

An Active route will be drawn on the chart as a thick red line, with the previous TurnMark drawn as a large green dot, and the next as a yellow dot. A TM is considered as been passed, when either the ship has passed a perpendicular to the mark (ie: the mark's bearing is now "aft of beam") and is on a heading for the next; or when the ship has come within a certain distance of the mark.

To display the **Route Data** form, select Route mode (press the [Route] button on the main toolbar), then touch any TurnMark on the desired Route to mark it as "selected" (the TM will be drawn as a solid red dot when selected). Now touch the same TurnMark and select the **[Route Details]** button from the quick button menu:



Depress the **[Activate]** button on either the **Route Data** form (pictured below) or the **AllRoutes** form to begin the "Navigate to Destination" scenario.

RTE Wed 00:11

TM 1: 12 hrs 28 mins
34°53'46"S 174°59'09"E

Steer 8° to Stbd

5.0Nm

063°T

045°MAG NE

VMG: 34.7 knots
TTG: 9 min 34 sec
ETA: Wed 18Aug 12:48

If no other N2D scenarios are active, then Navigation Data will appear in the red **Destination ViewPanel (DestVP)** for arrival at the next **TurnMark (TM)** along the Route.

As a TurnMark's perpendicular is passed, or its nominated ArrivalZone is breached, then the DestVP will change, and show data for the following TM.

Navigation

2 routes are loaded
No Routes Selected
Active Route: #1
Auckland to Fiji
Contains 8 TurnPoints
Depart: Wed Aug 18 00:11:56 2004

Total Distance: 1,272Nm
Elapsed: 0mtrs

Summary Route data will be written to the **Navigation ViewPanel**

Route Data ... Start mark: [Wpt 0] 35°08'33"S, 174°11'48"E Commenced: Wed 18 Aug 00:11

Auckland to Fiji View All ... Load ... Reverse Activate Delete Cancel

Hypotheticals: Start [ETD] 12:11:56 AM 18/08/2004 Arrival [ETA] 11:00:00 AM 1/01/1970 Pred.Speed 19.3 knots Default 10 kn

En Route: TER: 11 hrs 60 mins DER: 13.9Nm SpEnRte: 1.2kn

To Go: TTG: 2days 15h46m DTG: 1,259Nm Speed: 19.7kn

Route Totals: 3days 03h46m 1,272Nm AvgSp: 16.8kn Refresh

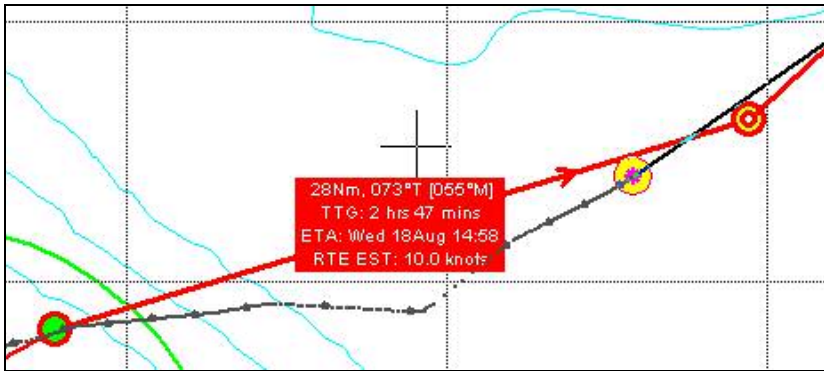
TurnMark	Destination	Arrived	Dist.	Hdg	Hyp.Sp	Est.Sp	TER/TTG
Bay of Islands	35°01'50"S 174°26'42"E	Wed 18 Aug 12:11	13.9Nm	061°T	35.0	10.0	11 hrs 60 mins
TM 1	34°53'46"S 174°59'09"E	...	28Nm	073°T	0.0	10.0	0 min 00 sec
Leave NZ	34°33'25"S 175°26'02"E	...	30Nm	047°T	19.3	10.0	1 hr 33 mins
TM 2	34°08'34"S 176°47'44"E	...	72Nm	070°T	19.3	10.0	3 hrs 43 mins
Suva - South	18°47'07"S 177°44'43"E	...	923Nm	003°T	19.3	10.0	1day 23h49m
Nadi	17°45'07"S 177°06'03"E	...	72Nm	329°T	19.3	10.0	3 hrs 44 mins
EOR	16°20'19"S 178°54'31"E	...	134Nm	051°T	19.3	10.0	6 hrs 56 mins

Route Settings: Colour Width 2 Labels 2 Draw Arrows Speed est. knots Keyboard Conversions OK

Complete up-to-date information about the current Route is available from the **Route Details** form. (Touch a Route TM twice then choose [Route Details] from the button menu).

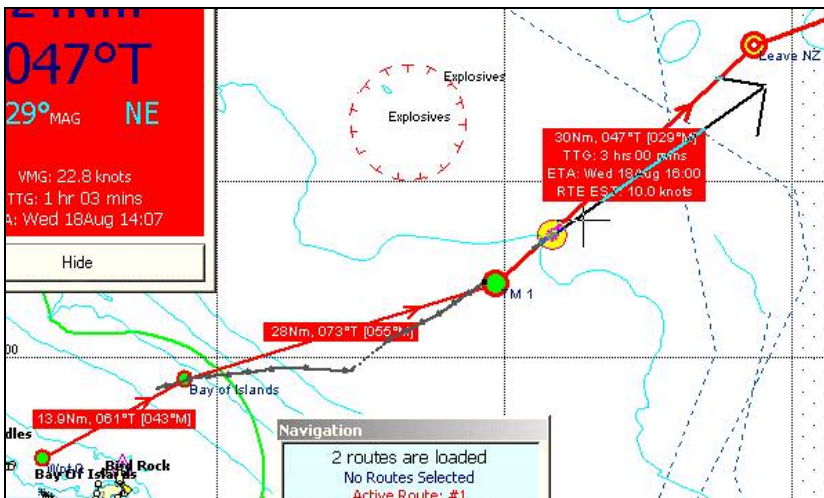
The **Green, Yellow** or **Grey** indicators will match the drawing of the corresponding TurnMarks on the chart display. Green TMs have been passed, the Yellow TM is the next ahead (whose data is in the DestVP), and the Grey TMs are still further ahead.

Estimated speeds for each leg can be set on this form, along with specifying new names for any turn mark.



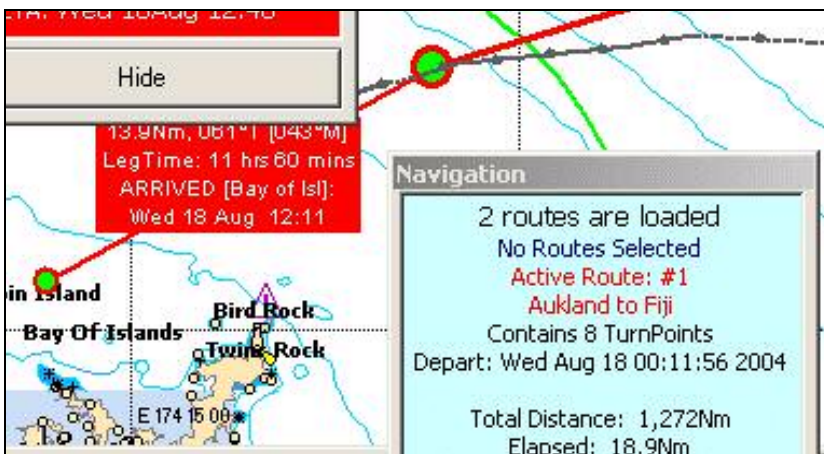
If visible, the **LegLabel** is always more detailed for the active leg.

The TTG and ETA on the label are based on an estimated speed pre-set (on the RouteDetails form) for that Route leg.



Set the LegLabels to 1 to also show the names of the TurnMarks on the chart.

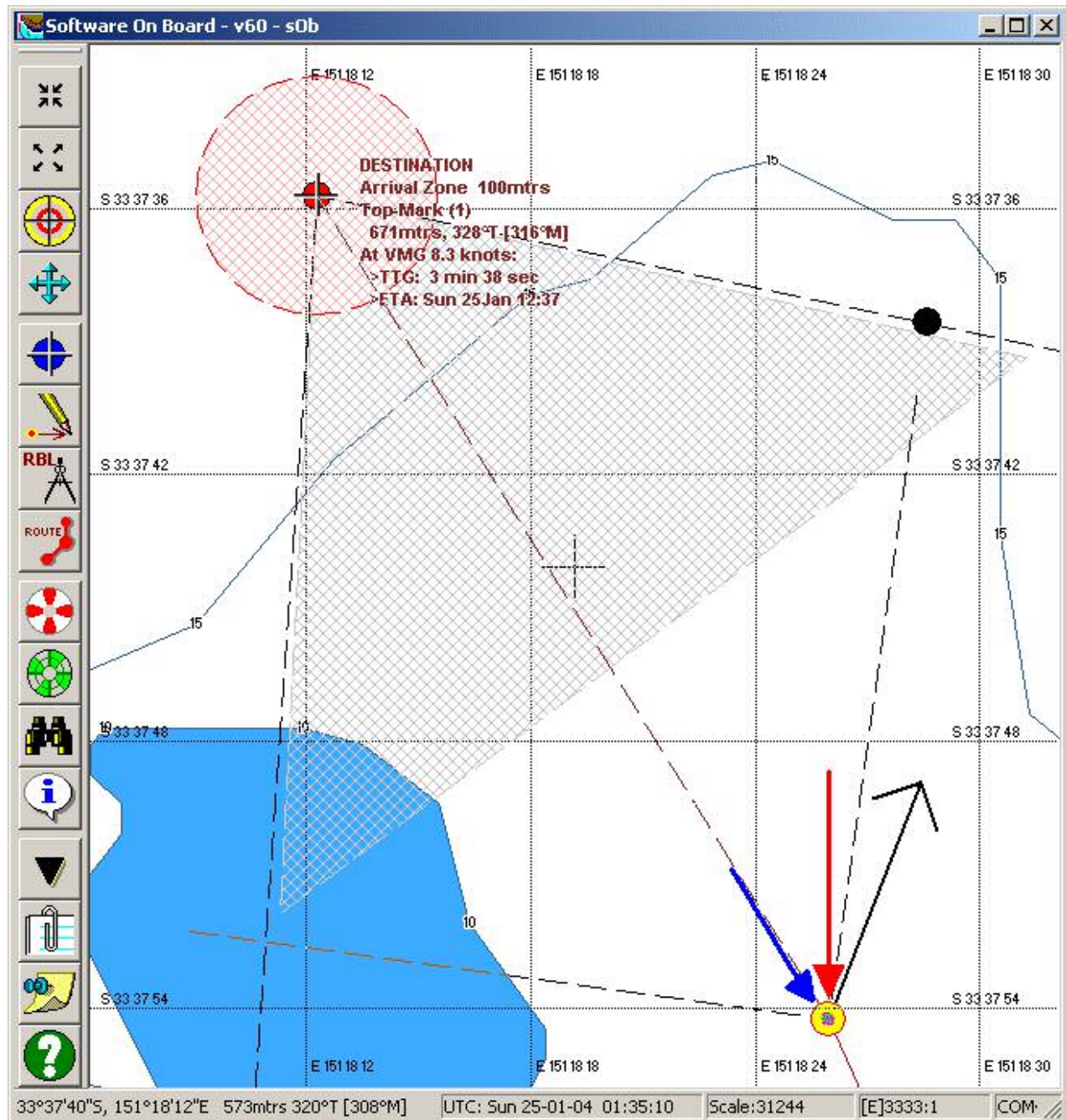
Rename the TurnMarks on the RouteDetails form by clicking on the name in the list. Type the new name, then press [TAB] or click somewhere else on the form to refresh ... avoid pressing [Enter] as this will close the form.



Once a leg has been completed, the LegLabel will display true time on leg and arrival time at the end of the leg.

WIND TOOLS

When an **Apparent Wind** sensor is connected (and it sends NMEA sentence: **VWR** or **MWV** - "Wind Angle and Speed"), several helpful indicators can be drawn on the chart...



Ship's Wind Shadow

Ideally designed for optimum upwind sailing, select (from the Ship's Data Form) either or both "Show Shadow" and "Show Laylines" and input your yacht's particular minimum angle that it can sail to the wind. The shadow thus displayed, represents the sector of the "Wind Circle" that your yacht cannot sail. Sailing along the laylines, if the Wind $\frac{1}{2}$ Angle is set correctly, represents the closest point of sail that your yacht can sail to the wind.

NOTE: On some displays, the Wind Shadow may (A) flicker annoyingly, or (B) slow the computer down too much. If either of these situations occur - uncheck the Wind Shadow box and utilise only the Wind Laylines (as pictured above).

Waypoint Wind Shadow

The Waypoint shadow is best used when the Waypoint is positioned to represent your upwind destination, it will help you sail optimally to this windward destination point. Once the Waypoint is correctly placed, click the Waypoint with the Waypoint selector button enabled to display the Waypoint Form. Now check "Show Shadow" and/or "Show Laylines" and set the $\frac{1}{2}$ Angle as described for the Ship's Wind Shadow. Generally speaking, the $\frac{1}{2}$ Angle for the Waypoint shadow should be the same as for the Ship's $\frac{1}{2}$ Angle, however in practice you may find that making the Waypoint angle slightly larger will ensure that you will clear the windward mark.

NOTE: the laylines are drawn exactly to the $\frac{1}{2}$ Angle, the shadow is drawn 2° narrower than the $\frac{1}{2}$ Angle. The Waypoint shadow works slightly differently to the Ship's shadow. The ship's shadow represents the sector where your yacht (under sail) CANNOT go, the Waypoint shadow represents the region where your yacht SHOULD remain to optimise your upwind leg (ie: sailing outside the Waypoint shadow means that you will cover unnecessary ground whilst sailing upwind).

Wind Vector Arrows

Open the Ship's Data Form (click the Ship's Target at any time) and check "Show Wind Tools", then check your choice of Apparent and/or True Wind Vectors.

The apparent Wind Vector is drawn as either a **red** or **green** arrow, dependent on whether you are sailing on **port** or **starboard** tack. The apparent vector is read directly from the Wind Instrument, and shows the relative wind direction as felt on the deck of the yacht (actually - from the masthead, or where-ever the anemometer is fitted).

The True Wind is calculated based on the ship's "Speed Over Ground" and "Course Over Ground" (SOG & COG as provided by the GPS) and the apparent wind speed and direction supplied by the Apparent Wind device. The true wind vector is displayed on the chart as a **blue arrow**.

NOTE: The apparent wind vector is ALWAYS closer to the bow of the boat than the true wind vector (when moving forward).

AUTO PILOTS

(typical NMEA sentences used by SOB and AutoPilots are included in square brackets)

- Refer to your AutoPilot manual to learn how to enable it for remote data control.
- Refer to Technical Information Chapter for wiring schematics to connect the AutoPilot to your computer (and SOB)

One, or all of three, options may be available with the AutoPilot device:

1. **Steer to Course**
 - as supplied by an electronic compass or SOB [**APA, APB, BOD, XTE**]
2. **Steer to Apparent Wind**
 - a wind sensor must directly connect to the AutoPilot [**usually VWR**]
3. **Steer to Destination Waypoint**
 - the destination waypoint information is sent via NMEA [**RMC, BWR, BWC**] from SOB, or a GPS, or some other NMEA devices

SOB will send any of the highlighted NMEA sentences if ticked on the NMEA Raw Data Form.

NOTE: A **Navigate to Destination** scenario must be active before SOB can send AutoPilot commands. The red Destination ViewPanel must be activated, by any of these conditions:

1. A Man-Over-Board scenario
2. A Waypoint marked as a Destination
3. An Activated Route

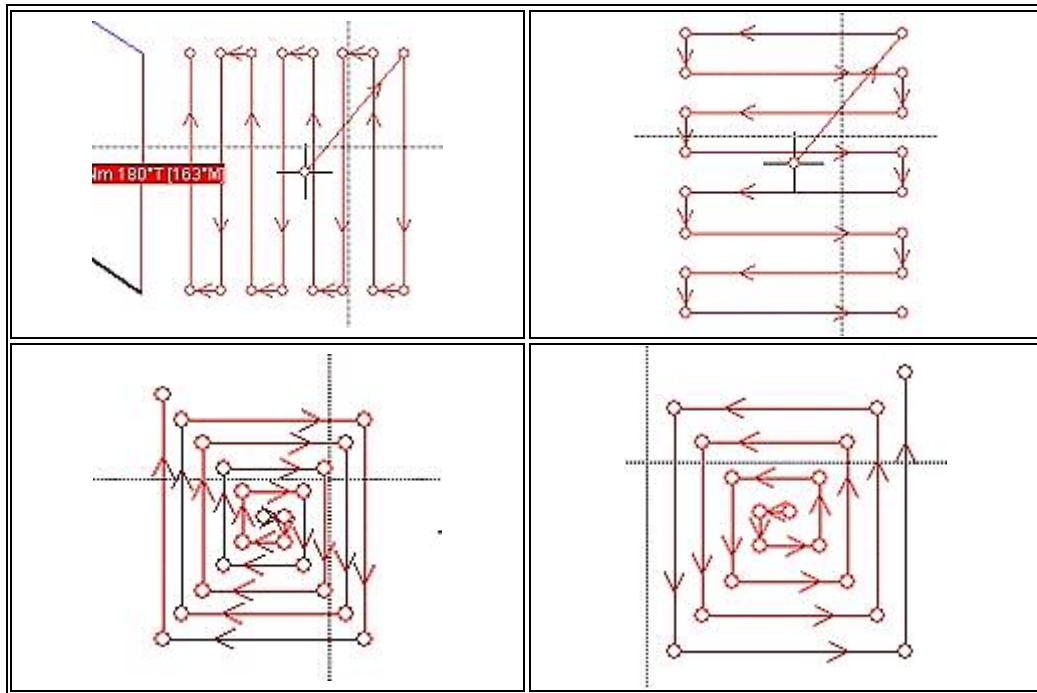
(Contact support@digiboat.com.au to get access rights to the **APA** and **APB** commands; please provide autopilot details, if known)

AUTO-SEARCH ROUTES

Access with the **[Create AutoRoutes ...]** button on the **AllRoutes** form.

Select whether to draw a grid or circular, and choose the leg direction to determine the shape of the auto route. Once the auto-route is ready, it can be used as is any other route: Loaded, Unloaded, Edited, Activated, Analysed etc

As well as the four shapes pictured, a further four configurations can be achieved by **Reversing** any of the auto routes after creating them.



If the Centre of the Search Area is unknown, then estimate it using the set and drift calculator on the form.

Create Search Routes

Design Search Pattern

☒ Grid ☐ Legs run N/S Search Area Nm

☐ Circular ☒ Legs run E/W Leg separation metres

Number of Rows = 63 Number of TurnMarks = 254

Calculate Centre of Search Area

Last Known Position Lat (±00.000°) Long (±00.000°)

Elapsed Time days hours minutes

Current & Drift knots ° True

Predicted Location

Centre of Search Pattern Lat (±00.000°) Long (±00.000°)

RAW NMEA DATA FORM

Raw NMEA Data			
Ship Data UTC <input type="text" value="Thu Nov 21 23:45:50 2002"/> Elapsed: 0 min 10.0 sec LAT <input type="text" value="-33.632833"/> LNG <input type="text" value="151.30516"/> SOG <input type="text" value="2"/> COG <input type="text" value="29.5"/> SPD <input type="text" value="0"/> HDG <input type="text" value="0"/>		Route Data rTOw <input type="text" value="SSS"/> rTOwname <input type="text" value="GNDZRO"/> rFRw <input type="text" value="+003"/> rFRwname <input type="text"/>	
Depth under Keel <input type="text" value="10.9728"/> below Transducer <input type="text" value="0"/> of Water <input type="text" value="0"/>		Wind Data windAve <input type="text" value="43"/> windAspeed <input type="text" value="14.5"/> windTa <input type="text" value="78.4727"/> windTspeed <input type="text" value="13.1085"/>	
Next WayPoint Data wnum <input type="text" value="SSS"/> wname <input type="text" value="HOME"/> wlat <input type="text" value="-33.6435"/> wlng <input type="text" value="151.30333"/> wrng <input type="text" value="1"/> wrbg <input type="text" value="255.8"/> wvmg <input type="text" value="-0.4"/> wvmgtH <input type="text"/> wtime <input type="text" value="0"/> warr <input type="text" value="A"/> weta <input type="text" value="0"/> wtlg <input type="text"/> weta <input type="text" value="0.51"/> wdis <input type="text" value="L"/>		Misc watertemp <input type="text"/> volts <input type="text" value="12.4"/> Time Zone <input type="text" value="0"/>	
NMEA Data Source <input type="text" value="Pittwater(Micrologic+DataLine).log"/>			
Reads <input type="text" value="9 pkts"/>		LastPktSize <input type="text" value="333 bytes"/>	
		Total Packets <input type="text" value="2.93/1473.6 Kb (%)"/>	
<pre> ▲ \$PSTOE,0.000,0.0,~ \$IMHW,0.0,0.00,M,0.00,N,0.0,~ \$IMWR,048,R,0.00,N,0.0,0.0,~ \$IIMTW,22,C~ \$IIDBT,0035.8,0.0,0.0,~ \$IMWR,048,R,0.00,N,0.0,0.0,~ \$GPGLL,3337.97,S,15118.31,~ \$IMHW,0.0,0.00,M,0.00,N,0.0,~ \$IDBK,A,0035.8,0.0,0.0,~ \$IMWR,048,R,0.00,N,0.0,0.0,~ \$GPXTE,A,A,0.51,L,~ \$IMWR,048,R,0.00,N,0.0,0.0,~ \$IMHW,0.0,0.00,M,0.00,N,0.0,~ \$PSTOA,~ \$PSTOA,0,~ \$IMWR,047,R,0.00,N,0.0,0.0,~ \$IDBK,A,0035.8,0.0,0.0,~ \$PSTOE,0.000,0.0,~ \$IMHW,0.0,0.00,M,0.00,N,0.0,~ \$IMWR,048,R,0.00,N,0.0,0.0,~ \$IMLW,2058.9,N,0.00,N,~ \$PSTOB,12.3,v~ ▼ \$IMWR,048,R,0.00,N,0.0,0.0,~ </pre>			
<input type="checkbox"/> Save to "SOB NMEA DATA.log"			
Transmit NMEA Data AutoPilot: <input type="checkbox"/> RMC <input type="checkbox"/> BOD <input type="checkbox"/> BWR <input type="checkbox"/> APA <input type="checkbox"/> APB For GPS: <input type="checkbox"/> RTE <input type="checkbox"/> WPL			
<input type="button" value="OK"/>		<input type="button" value="Refresh"/>	
		<input type="button" value="Close COM2"/>	
		<input type="button" value="Replay a Log File"/>	
		<input type="button" value="Play"/>	
		<input type="button" value="<<"/> <input type="button" value=">>"/>	
		<input type="button" value="Stop Replay"/>	
<input type="button" value="Show NMEA Waypoint on Chart"/>		<input type="button" value="Close"/>	

POWER USERS

- [RADAR connections](#)
- [Importing Routes and Waypoints from a GPS](#)
- [NMEA Log Files](#)
- [PastTrack](#)
- [Analysing a Voyage](#)
- [Voice Recognition](#)

PLEASE NOTE: Information presented in this chapter often assumes a high level of Windows™ proficiency, (mostly in regard to file handling, opening and manipulation).



RADAR

NMEA sentence: **RSD** - "RADAR System Data"

Most modern RADAR instruments can connect via NMEA to SOB.

SOB can re-display the RADAR unit's cursors, marks and range-rings directly on the chart surface.

The **RSD** NMEA sentence contains information about the RADAR cursor's current location, and up to two separate RADAR targets, as set by the user of the RADAR device.

Using this data, SOB will estimate the range and bearing of each mark, then extrapolate to determine whether the RADAR marks and the Ship are on a converging course and whether a collision is likely.

NOTE: SOBv66 can not display the Raster Image that the RADAR builds from its magnetron, nor any automatic ARPA sending devices.

Additional SOB AccessRights must be issued to fully utilise SOB's RADAR capabilities. If you have a connected RADAR, and the **NMEA Radar Data** form is displaying correct information, please contact support@digiboat.com.au for further instructions.

NMEA Radar Data

☐ Show RADAR Cursor

Cursor Position: -33°41.05', 150°52.47'

Dist to Cursor: 0.364

Brg to Cursor: 261.6

Scale: 0.5

☐ Show Radar Rings

☐ Extrapolate course lines

☐ Show Radar Target 1 ☐ Show Label

Start Position: -55°24.41', 166°00.39'

Logged Time: Mon Jan 19 23:15:02 2004

Dist. from Ship: 24.052

Brg to TRGT: 159.3

Position: -33°37.17', 150°54.74'

Logged Time: Mon Jan 19 23:15:02 2004

Dist. from Ship: 0.072

Brg to TRGT: 26

☐ Show Radar Target 2 ☐ Show Label

Start Position: -33°37.90', 151°18.43'

Logged Time: Mon Jan 19 23:15:02 2004

Dist. from Ship: 0

Brg to TRGT: 0

Position: -33°31.41', 151°17.00'

Logged Time: Mon Jan 19 23:15:02 2004

Dist. from Ship: 0.11

Brg to TRGT: 349.6

Close

IMPORTING ROUTES AND WAYPOINTS FROM A GPS

The GPS device must be capable of transmitting the **WPL** NMEA sentence – please refer to your GPS Manual to see if it does and to learn how to do this.

Some GPS units may only be able to transmit the WPL sentence as part of a Route transmission. The GPS will first send the **RTE** sentence, followed by a WPL command for each waypoint in the route. To capture waypoints thus transmitted, first construct a route (in the GPS) including any waypoints you wish to transmit, then enable "Navigate" or "Go to..." mode in the GPS to turn on the transmission.

Most **Magellan** GPS devices should transmit Wpts to SOB without the need to first create a route. Most **Garmin** GPS units will likely require you to first create a route to transfer the waypoints, as described.

Using either the SOB AllWaypoints form or AllRoutes form, the [Capture] button will create a list of the waypoints received by SOB. This waypoint list can then be imported and converted into a standard SOB Route or Waypoint file. The standard file can be loaded/unloaded into SOB using regular SOB file loading techniques.

Alternately, your GPS may be able to send waypoints in a TEXT list format (refer to the GPS manual). Such a list would need to be captured to the PC via HyperTerminal (installed as a standard Windows™ program in Start menu), then saved to a ".txt" file.

SOB's AllWaypoints form will automatically convert a text list into a SOB ".wpt" file when loading.

Refer to Installation Notes in the next chapter for details about the format for importable ".txt" files.

A further option is to use a third-party program for importing/exporting waypoint lists from/to the GPS using regular text files...see example that follows:

Example using 3rd-Party software

1: Export Wpt file from SOB to a GPS

- SOB can export a ".wpt" file to a list of wpts in a ".txt" file (use the [Export] button on the AllWaypoints form)
- Locate this new file in the SOB\Waypoints folder, "tweak" the file layout if necessary so that it's the correct format for the 3rd-party software
- Now use 3rd-party program to upload the text file to the GPS

2: Import Wpt list from GPS to SOB

- Use 3rd-party program to capture a list of wpts to a computer file
- Make sure this file has a ".txt" or ".csv" file extension, and copy/move to the \SOB\Waypoints folder
- Use SOB's AllWaypoints form to automatically convert this text file to SOB's ".wpt" format
- Load/UnLoad in SOB in the usual manner using the AllWaypoints form

Capture the Current Destination Waypoint from GPS



Use the button on the Raw NMEA Data form to display any active Waypoint as listed in the "Next Waypoint Data" fields from the GPS on SOB's chart display. This Waypoint when drawn by SOB will be a small black un-crossed circle.

If a route is active in the GPS, then the Wpt data shown in the "Next Waypoint Data" fields will be cycling through all waypoints nominated for the route, in this case, pause the NMEA data first by pressing the "Close COMx" button, before capturing.



NMEA LOGFILES

"SOB NMEA DATA.log"

The NMEA DATA log file is used to replay a voyage in SOB. In fact ANY plain text file containing NMEA data can be used by SOB to replay a voyage (eg: data captured by HyperTerminal). These files can be easily copied (or emailed) between different computers and the past voyage replayed as often as you wish.

The data written to the file will resemble the text in this example, each line as known as a **NMEA Sentence**:

```
$GPGSA,A,3,06,10,15,17,18,22,23,24,26,29,30,,1.2,0.8,0.9*37
$IIVPW,+00.00,N,,
$GPGSV,3,1,11,06,62,330,44,10,22,127,39,15,30,235,42,17,53,219,44*79
$IIVLW,09015.6,N,322.70,N
$GPGSV,3,2,11,18,33,288,42,22,02,230,32,23,64,157,43,24,01,074,35*72
$IIVHW,,,,,00.00,N,,
$GPGSV,3,3,11,26,59,076,46,29,54,103,45,30,02,331,38,,,,*40
$IIVWR,048,R,27.8,N,,,,
$PGRME,4.7,M,6.4,M,7.9,M*21
$IIVLW,09015.6,N,322.70,N
$GPGLL,3645.424,S,17500.969,E,005953,A*3E
$IIVWT,049,R,27.4,N,,,,
$PGRMZ,40,f,3*2F
$IIVHW,,,,,00.00,N,,
$PGRMM,WGS 84*06
$IIVWR,047,R,27.8,N,,,,
$GPBOD,337.7,T,318.2,M,GNDZR0,*3A
$IIDBT,,,0045.8,M,,
$GPRTE,1,1,C,0,GNDZR0*5E
$IIVLW,09015.6,N,322.70,N
$GPWPL,3514.481,S,17411.581,E,GNDZR0*23
```

Optionally save ALL NMEA data received by SOB to a standard NMEA format log file by "ticking" the checkbox on the **Raw NMEA Data** form which selects whether to write this log file or not.

Regularly throughout a long voyage, or at the completion of your voyage, use **Windows™ File Explorer** to save this data to an appropriately named file and place it in the **\LogFiles** folder for easy replay from the buttons on the **Raw NMEA Data** form.

The folder that this file is usually found in is the main **SOB** program folder...although the file's default location can be a bit arbitrary on some installations. If the NMEA log file is not found in the **SOB** folder, use **Find** or **Search** on the **Start Menu** to search the hard disk for this file name.

NOTE: This logfile is ONLY AVAILABLE after SOB exits. If you try any file operation on it while SOB is running you get a "File Open Error" from Windows.

PAST-TRACK

*** NOTE: SOB must be Unlocked to enable all PastTrack features ***

The colour of the **PastTrack** "crumbs" depends upon the navigation mode. Log **file replay mode** will show a red PastTrack, while **dead reckoning mode** will show a grey coloured PastTrack. Real-time navigating mode with an active GPS will show black dots with the double-sized dots highlighted. Note that other colours may be possible if the track has been imported from an external source (eg: your chartplotter via the C-MAP UserCard and USB Card Reader).

Selectively display or hide the Ship's past track with a checkbox on the **Setup Ship** form. This form contains buttons for clearing, saving and converting the displayed track.

PastTrack Log Files

When SOB exits, the current on-screen PastTrack will be logged to two different files:

!PastTrack.txt will be appended with any unlogged points from the current session. This file will continue to grow until deleted or renamed. The data in this file is designed to be thoroughly analysed with Excel. (see next section: Power Users - Analyse your Voyage)

!LastTrack.trk will be created to temporarily hold the current PastTrack, this track will be redisplayed in SOB when next started. The LastTrack file uses the same format as the PastTrack file. This allows ANY logged track to be redisplayed in SOB.

Some work must be done manually to re-display an old track saved in the !PastTrack.txt file:

1. open "!LastTrack.trk" in Windows Notepad. Delete the entire contents. Keep the file open.
2. open "!PastTrack.txt" in Notepad. Find the part of the log you're interested in. (Use UTC, Lat, Lng to locate first and last points of interest)
3. use drag or keyboard techniques to highlight all lines between your chosen first and last points. Copy this selection to the clipboard. Close/Exit this file.
4. switch back to the still open, but now empty LastTrack file (from step 1), and paste in your clipboard
5. save this !LastTrack.trk file.

Recommended re-save (or copy) this new LastTrack file to another name - as a backup, so that in the future this track can be easily reloaded in SOB by simply "copying {mytrack.trk} to !LastTrack.trk" before starting SOB.

Auto-Convert PastTracks to Routes

At any time you can convert your PastTrack to a Route with a button on the **AllRoutes** form or the **Setup Ship** form. Only the large track dots are used when converting to a route.

SOB also automatically converts any unlogged TurnMarks to a Route (named **PastTrack00x.rte**) and saves it to the Routes folder when SOB exits. The auto route will NOT be created if there is less than 20 minutes of data (running time).

When saving a Route in SOB to a file (either automatically when SOB exits, or at choice in the **AllRoutes** form): If the Route name already exists, it will be copied to the **Routes\archived** folder and the new Route from the current SOB session will be saved to the **\Routes** folder.

ANALYSING YOUR VOYAGE

SOB will automatically create and keep updated a Log File: **LogFiles\!PastTrack.txt**

However, if SOB has not been **Unlocked**, then PastTracks will not be logged to file (ie: if AccessLevel = 0).

SOB logs a lot of data about the ship every few seconds to a standard "row/column" formatted text file for direct importing into a spreadsheet for archival purposes or voyage analysis.

The logfile is appended every few hours (about 4.5) of running time, and any unlogged data is added to the logfile when SOB exits.

This file can get quite large when SOB is employed in a real-time navigation scenario. The file grows at about the rate of 1 Megabyte every 24 hours of running time.

A typical use would be to import the logfile into a spreadsheet every day or so, deleting the !PastTrack.txt file after importing. The logfile will be re-created the next time (about every 4.5 hours) that SOB is logging data.

The data logged by SOB to this file is:

Column Heading	Description
TIME	UTC time for this row of data
LAT/LNG	Latitude and Longitude
MODE	Real-time, Dead Reckoning or Voyage Replay
COG	Course (Over Ground)
SOG	Speed (Over Ground)
DEPTH	Depth of Water
AWD	Apparent Wind Direction
AWS	Apparent Wind Speed
TWD	True Wind Direction
TWS	True Wind Speed
TEMP	Water Temperature
ALT	Altitude (Height above MSL)
TRIP	Accumulated Distance

When imported into Excel, the resulting data will appear as: (after some simple formatting)

Microsoft Excel - IPastTrack Berimilla Pittwater-Harbour.xls

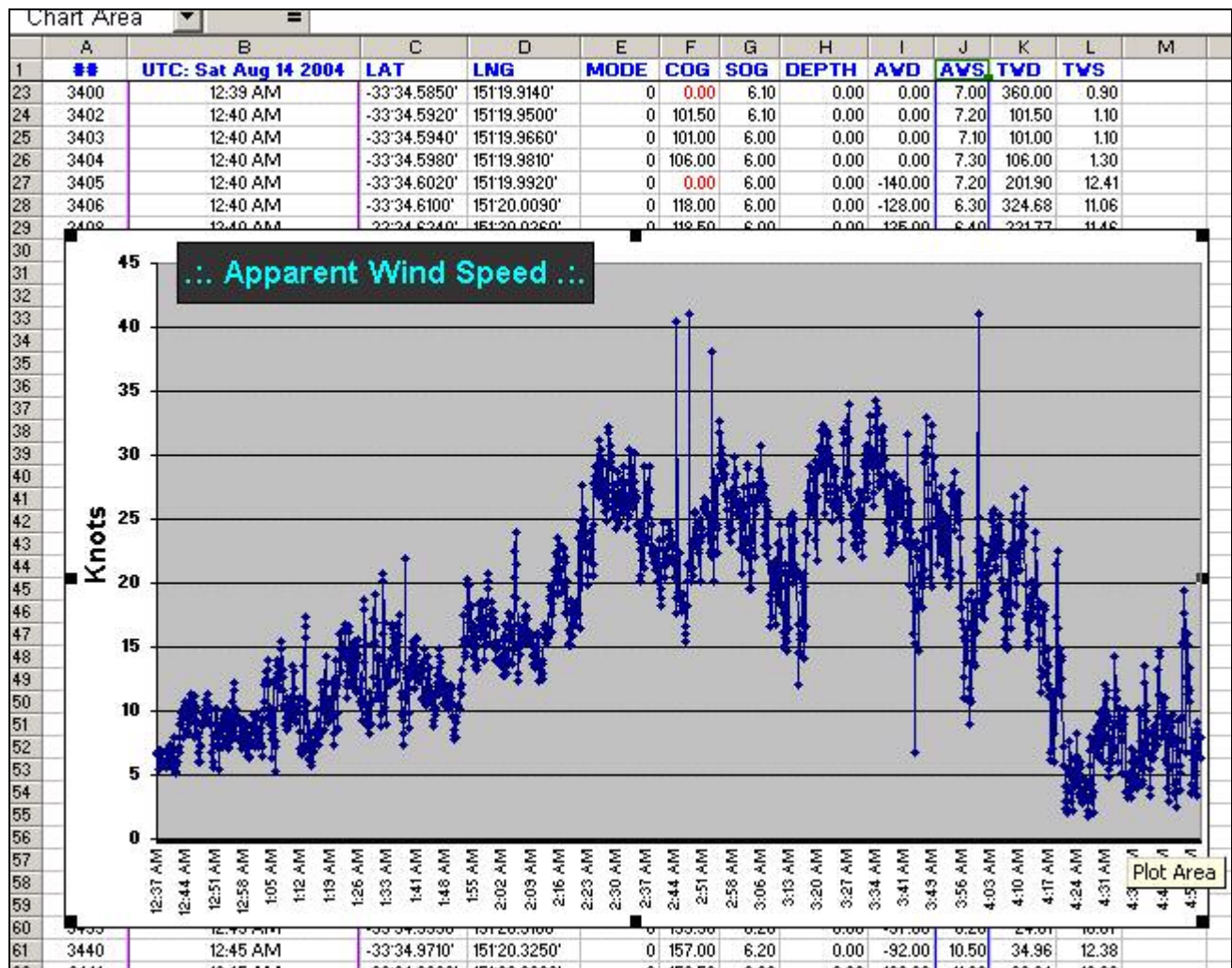
File Edit View Insert Format Tools Data Window Help

Arial 10 B I U \$ % , +.00 -.00 70%

B4 = 12:37:24 AM


	A	B	C	D	E	F	G	H	I	J	K	L	M
1	##	UTC: Sat Aug 14 2004	LAT	LNG	MODE	COG	SOG	DEPTH	AVD	AVS	TVD	TWS	
2	3379	12:37 AM	-33°34.5600'	151°19.5770'	0	86.00	6.20	0.00	-140.00	6.80	286.96	12.22	
3	3380	12:37 AM	-33°34.5580'	151°19.5980'	0	84.50	6.20	0.00	-95.00	6.60	308.72	9.51	
4	3381	12:37 AM	-33°34.5580'	151°19.6100'	0	85.00	6.20	0.00	21.00	5.50	203.39	2.24	
5	3382	12:37 AM	-33°34.5570'	151°19.6260'	0	87.50	6.20	0.00	-109.00	6.90	305.18	10.67	
6	3383	12:37 AM	-33°34.5580'	151°19.6430'	0	91.50	6.20	0.00	-118.00	6.50	303.31	10.89	

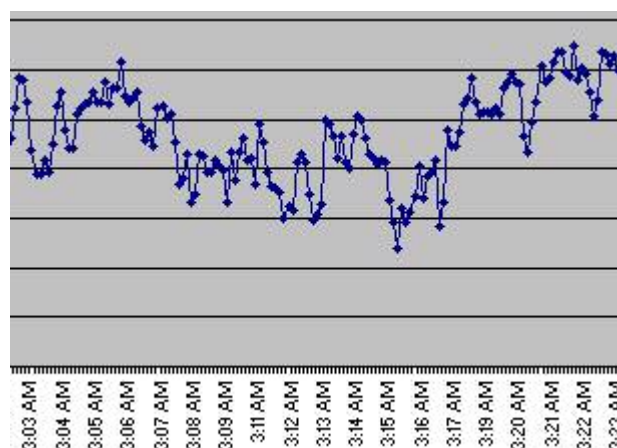
Now use Excel's powerful tools to analyse or present this data in a multitude of different ways. For example, a graph of the apparent wind speed for the voyage can reveal much interesting and useful information:



Zoomed-in from the example chart (pictured above), the entire voyage, or any part of the voyage can be visually analysed with Excel's powerful charting tool.

To create this chart in Excel, simply highlight the **Time** column and the **AWS** column (for this example), then press the

 **Chart Wizard** button on the Excel toolbar, select a "Line Graph" option from the choices provided and press [Finish].



VOICE RECOGNITION AND SPOKEN COMMANDS

Voice recognition is built into Windows XP, refer to your Windows™ User Manual for instructions on how to enable and use this feature.

Voice (or speech) recognition can function in two different ways:
(1) Commands, or (2) Transcription.

With adequate "training" of the speech recognition engine, and a disciplined "dictation" voice, it is not unreasonable to expect better than 95% recognition accuracy during a "transcription".

However SOB does not have a use for the dictation properties of speech recognition, rather, SOB uses **Spoken Commands** to activate **Macros** that are linked to SOB's features. Each user must set-up these macros for their own use (using techniques as described in the Windows™ voice recognition manual).

The design of SOB should allow any feature to be accessed with a two or three word command. Organise and plan your tasks thoroughly before beginning to create the **voice command macros**.

Some examples:

SOB Voice Command	Configure Macro to Perform These Actions...
Centre-Ship	press [Centre-Ship] button on SOB Toolbar or [space] key
Autocentre-Ship-Mode	press [Info] then [Centre Ship] buttons
Show-Ships-Form	press [F9] key
Show-AllRoutes-form	press [F11] key
Show-Conversions-form	press [F12] key
Close-Form	close any open form (a default command)
Select-Waypoint-Tool	click Waypoint button on SOB Toolbar
Select-Routing-Tool	click Route button on SOB Toolbar
Pan-East	click to right of display centre
Pan-Far-East	click on right edge of screen

In addition, many of the standard command macros created by the speech engine will be suitable for using with SOB. ie: Maximize, Minimize, Tab, Go-Down, Go-Up, Page-Down, Enter etc...

TECHNICAL INFORMATION

- [Supported NMEA Sentences](#)
- [Connecting Navigation Instruments](#)
- [Sample Wiring Schematics](#)
- [Configuring the COM/Serial portm Using HyperTerminal, Using COMM Detector](#)
- [Installation Notes](#)

SUPPORTED NMEA SENTENCES

CODE	Talk/Listen	Enabled	Description
Radar			
RSD	L	yes	RADAR System Data (Talker is ARPA)
Wind			
VWR	L	yes	Apparent Wind Direction and velocity
MWV	L	yes	Wind Speed and Angle
Depth, Temps & Other			
DBK	L	yes	Depth below keel
DBT	L	yes	Depth below Transducer
DPT	L	yes	Depth & Transducer offset
MTW	L	yes	Water Temperature
PSTOB	L	yes	Battery Volts (Dataline Proprietary)
AutoPilot			
APA	T	yes*	Autopilot format A
APB	T	yes*	Autopilot sentence B
BOD	T/L	yes	Bearing - Origin to Destination waypoint
BWR	T/L	yes	Bearing and Distance to Waypoint (Rhumb Line)
BWC	T/L	yes	Bearing and Distance to Waypoint (Great Circle)
XTE	T/L	yes	Cross track error
ASD			Autopilot system data
AAM			Arrival Alarm
Ship & Nav			
GLL	L	yes	GPS Position (Global Latitude & Longitude)
GLP	L	yes	Time and Position
HDM	L	yes	Compass Heading
VTG	L	yes	Course/Speed over Ground
VHW	L	yes	Course/Speed over Water
ZDA	L	yes	Time and Date
RMA			Navigation data from present position (Loran sentence)
RMB	T/L	yes	Recommended minimum navigation information
RMC	T/L	yes	Recommended minimum specific GPS/Transit data
GPS Data			
GGA	L	yes	GPS Fix data
GSA	L	yes	GPS dilution of precision and active satellites
GSV	L	yes	Satellites in view
SGD	L	yes	Accuracy
Waypoints & Routes			
BWW	L	yes	Bearing from Source waypoint to Destination waypoint
WDC/WDR	L	yes	Distance to Waypoint (Great Circle/ Rhumb Line)
WCV	L	yes	Velocity Made Good to Waypoint
ZTG	L	yes	Time to go to Waypoint
R00	T/L		Waypoints in active route
RTE	T/L	yes**	Waypoints in active route
WPL	T/L	yes**	Waypoint location

* AccessLevel=2 Unlock Code required (email support@digiboat.com.au)

** RTE & WPL output (talking) to be enabled in an "interim" SOB release

CONNECTING NMEA NAVIGATION DEVICES

Any navigation instrument that is **NMEA 0183** compatible can connect to SOB.

Examples: GPS, Autopilot, RADAR, Apparent Wind Instruments, SONAR (Echo Sounder) for Depth, Speed LOG, Electronic Compass (fluxgate, gyro), Temperature Senders, Volt Meters.



Typical Laptop Connections

(from left): Printer, USB, Docking Station, Serial/RS-232 (female 9-pin Serial plug below), External Monitor, External Mouse/Keyboard

Example Connection Scenarios

Example 1: I have a Garmin GPSMAP-232 and I need some info on what pins to connect to on my laptop. I don't have an autopilot or any other NMEA devices.

Example 2: My laptop doesn't have any serial ports, but plenty of available USB ports.

Example 3: My new GPS has USB cable only and is connected straight to the USB socket on the laptop...go straight to **Step 4**

Step 1

You need the PC connection cable supplied by Garmin as a standard accessory:

Example for "**GPSMAP-232**" http://shop.garmin.com/accessories_for_product.jsp?sku=010-00250-00

Power/data cable (bare wires) Part #: 010-10083-00 \$23.30

Notice that they also have:

USB to RS232 converter cable Part #:010-10310-00 \$59.99 which we need for ex 2 in **Step 3**

Also, with this particular model of the Garmin, and if you have 240/110 Volt power at the GPS unit, you have the option to skip **Step 2** by getting Part #010-10275-00/1

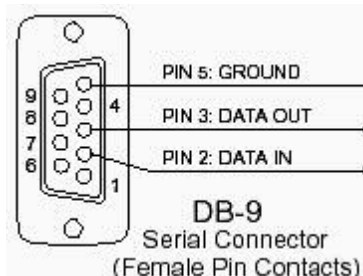
Step 2



Connect a regular "**9-pin Female Serial Plug**" to the NMEA wires from Part 010-10083-00 (for our example 1)

The serial plug is available from Computer or Electronics shops for a few dollars. If you don't have serial ports (example 2), you must still connect the serial plug to the wires from the GPS ... see step 3.

Determine, from the Garmin manual or any notes that came with the accessory, which of its NMEA output wires are **GROUND** and which is **DATA** (each product chooses to name these differently - sometimes A & B, NEG & POS, or EARTH for GROUND, or OUT for DATA, etc etc).



The wire-to-plug connection involves soldering two (or three) small wires to even smaller holes. The soldering is easy, it's the fiddly parts that make this job more complex. Test the connection using the "tug test", it will want to be a strong solder joint to survive the marine environment. Recommend that you knot or kink the wire before it leaves the plug housing to prevent direct pulling on the solder joints, some plugs include a clamping mechanism where-in the wire usually needs to be padded-out for the clamp device to work effectively.

The pin numbers are impressed into the plastic of the plug next to the correct pin. Pin 3 is only connected if the accessory cable has a wire for NMEA-IN - this allows SOB to talk to the GPS, perhaps uploading waypoints or routes, if they're compatible.

Only pins 2 & 5 are required for SOB to connect to a GPS. Pin 3 typically connects SOB to an AutoPilot.

If PC/laptop has a serial port, go to **Step 5**

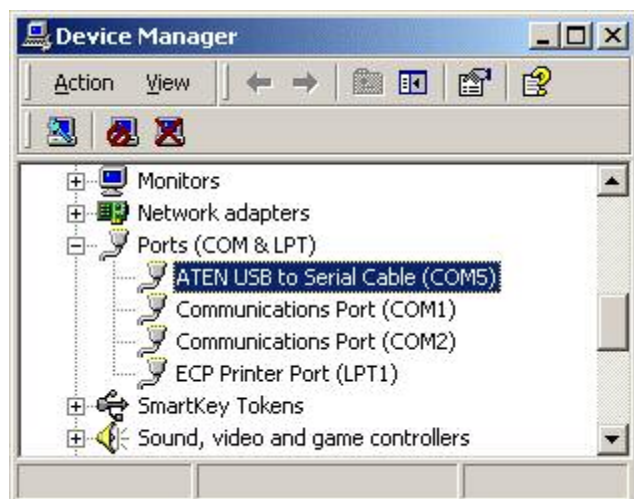
Step 3



If your laptop doesn't have a serial port, you'll need a **USB to RS232 Converter Cable**, again from Computer or Electronics shops for about \$60 AUD. This will complete the link between the Serial GPS plug and the computer's USB socket.

Notice that Garmin also supply them as an accessory (see example in Step 1).

Step 4



Install the driver for the USB-COM converter cable (or USB GPS driver for Example 3).

Use **Windows™ Device Manager*** to confirm that a **Virtual COM Port** has been assigned to it (COM5 in the example at left, SOB should be set to use COM5 when the GPS is connected to the **USB to Serial Cable**.)

The newer USB GPS devices will also require a virtual COM port to be assigned. Use Device Manager to check for the Virtual Port assignment, and to know which COM number SOB should use.

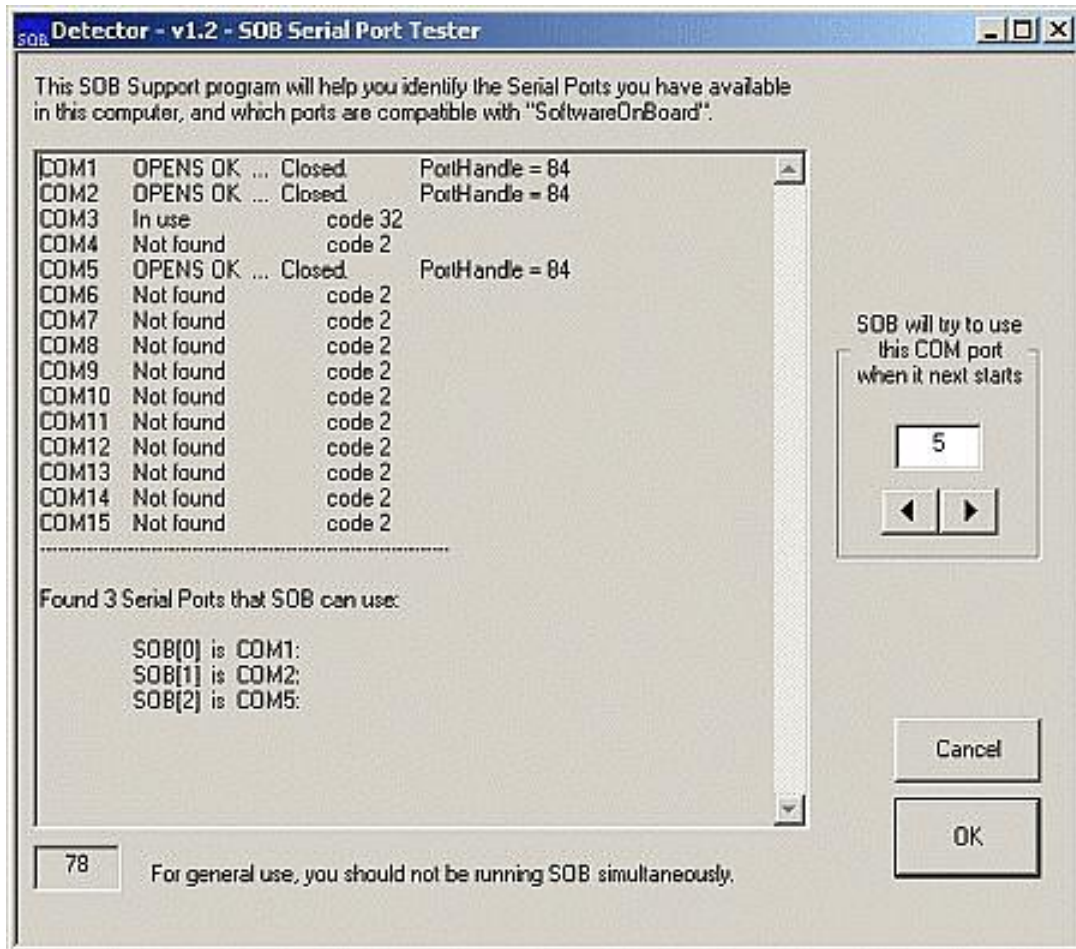
* Device Manager: right-click "My Computer", select "Properties". Choose "Hardware" or "Device" page (Windows versions differ at this point, however the Device Manager program is similar to the screen-shot at left, for all versions)

Step 5

If SOB doesn't autodetect the correct COM port on startup, use "**COM Detector**" to preset SOB to the COM port discovered with Device Manager in Step 4.

See [Configuring](#) (later in this chapter) to check that the GPS and PC are connected and exchanging data ... COM Detector is supplied with SOB and can be found in the **\SOB** folder. It is also available for download.

SOB COM Detector



In this example, the PC has three COM ports that are suitable for SOB to use.

SOB will use the previously used COM port (if still available), or else it will use the first valid COM port found when it next starts up.

For this example, SOB would be manually set to use COM5. Otherwise, when SOB starts, it will see that COM1 is available and suitable, so it will become the default port to use.

MORE CONNECTION INFO



SOB uses only one COM port - multiple **NMEA Talker** devices that can't be "daisy chained" will need to be **multiplexed** to use a single serial port.

A **Multiplexer** combines multiple Serial/COM devices to use a single PC Serial/COM Port

If no spare serial ports are available on the computer, a **USB to Serial Converter** is usually a simple solution (pictured in Step 3 – above). These cheap devices easily create more COM ports by using the new USB interface.

Most **NMEA devices** will be automatically set up with the proper settings. If you are experiencing communication problems, check the following settings are correct...

Configure your NMEA devices for:

- 0183 compatible protocol
- 4800 bps (baud rate)
- NMEA Version 2.x (or any lower version)
- WGS-84 Standard (for GPSs)

Consult the device's manual to enable the device for **Data Output** or **NMEA Output** (or similar).

Multiple **NMEA Listeners** can be wired to read the NMEA sentences transmitted by SOB via the COM port output (RMC, APA, BOD etc).

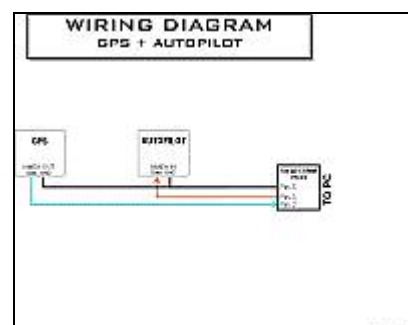
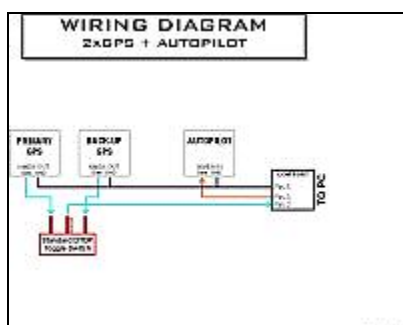
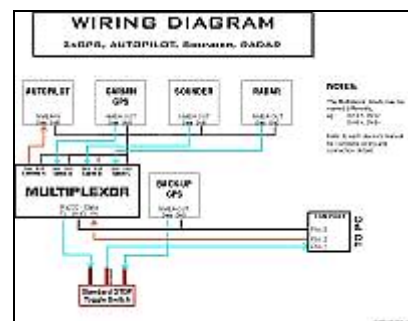
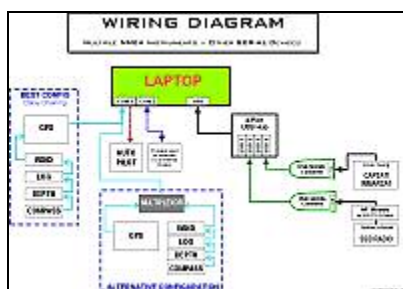
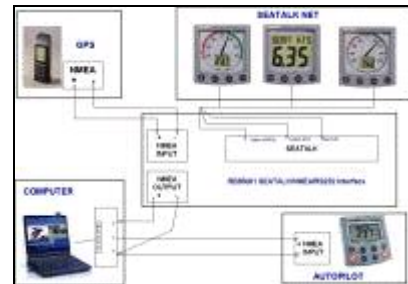
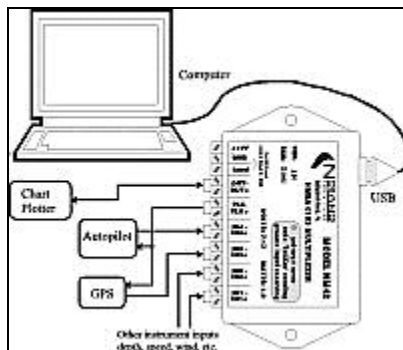
To determine if SOB is receiving the NMEA data correctly, double-click the chart display to show the **Raw NMEA Data** form. The window panel on the right will fill with clear, ordered alphanumeric "sentences" similar looking to this list:

```
$GPBOD,337.8,T,318.4,M,GNDZR0
$GPRTE,1,1,c,0,GNDZR
$PGRME,3.6,M,4.9,M,6.1
$GPGLL,3637.320,S,17452.979,E,234541
$GPRMC,234542,A,3637.322,S,17452.980,E,008.3,154.5,211102,019.4
$GPRMB,A,0.01,R,0,GNDZR0,3514.481,S,17411.581,E,089.3,337.8,-008.3
$GPGBA,234542,3637.323,S,17452.980,E,1,11,0.9,26.9,M,28.9,M,0
$GPGSA,A,3,05,06,10,15,17,18,23,24,26,29,30,0,1.5,0.9,1.
$GPGSV,3,1,11,05,10,341,38,06,64,239,44,10,52,138,45,15,08,259,3
$GPGSV,3,2,11,17,29,250,40,18,07,311,34,23,76,298,44,24,21,099,4
$GPGSV,3,3,11,26,35,034,43,29,42,048,44,30,25,307,37,0,0,0
$PGRMZ,88,f
$PGRMM.WGS 8
```

SAMPLE WIRING DIAGRAMS

- USB Multiplexor
- Example Raytheon Seataalk configuration
- Daisy chained NMEA Instruments; and multiple other Serial Devices
- Multiple NMEA Instruments and Multiplexor
- GPS + Autopilot
- 2x GPS (one backup) + Autopilot

These Schematics are available full size from the Online User Manual: <http://www.digiboat.com.au/manual>



CONFIGURING AND CHECKING THE COM/SERIAL PORT

Using Windows™ HyperTerminal to test Serial Port Data

A simple and useful program that is automatically installed with Windows, is **Hyperterminal**. (Start>>Programs>>Accessories>>Communications).

As HyperTerminal starts, check the screens are similar to these below:

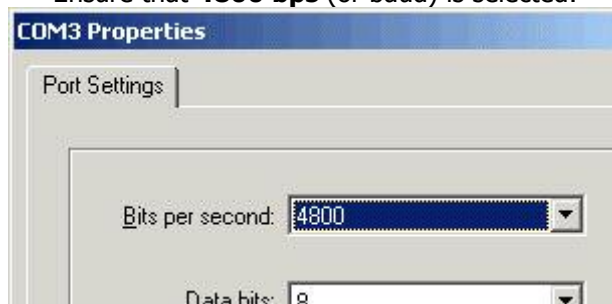
Type any name in this box (we suggest NMEA or GPS etc):



Select the first COMx in the list, if this doesn't work then (later on) we'll try the others:




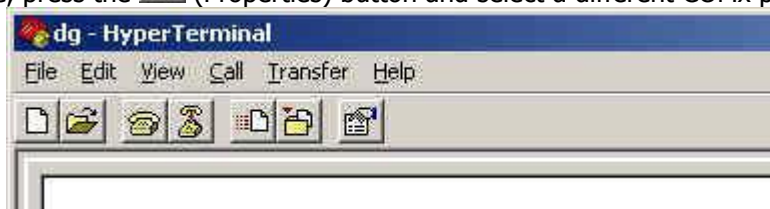
Ensure that **4800 bps** (or baud) is selected:



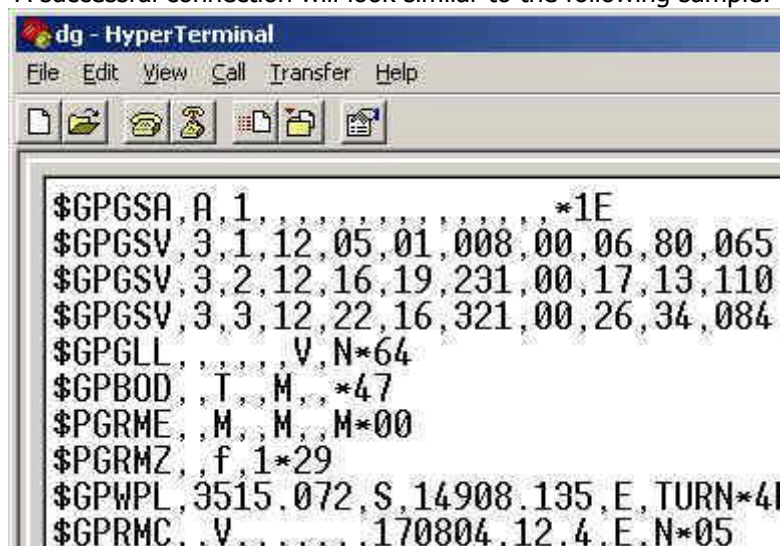
If the screen doesn't start to fill with data, then the COMx chosen is probably not the one receiving data.

First, try pressing the  (On-Hook Telephone) button to start the connection.

Otherwise, press the  (Properties) button and select a different COMx port to test.



A successful connection will look similar to the following sample:



Further Help with SOB COMM/Serial Connections

- A utility program **COMM Detector** is available on the [Download](#) page which can assist with troubleshooting Serial Port issues, and will clearly display any Serial Ports that are available and compatible with SOB. "Detector" can also be used to set/reset SOB's default COMM Port
- Extra help with connecting hardware for use with SOB can be found in the [FAQS](#) (Frequently Asked Questions), or on our [Message Board](#)
- Registered SOB users can contact support@digiboat.com.au for assistance with their SOB-NMEA connections.
- For data cables for GPS to PC connecting, check the particular device's website, eg: www.garmin.com
- Email us at support@digiboat.com.au and request a schematic diagram to help you wire up your own cable (provide details of equipment you are using)

INSTALLATION NOTES

SOB is installed in an unconventional manner ...

SOB is designed to be self contained within its own folder (similar to MYOB or the DOS programs of old...). This enables an installed copy of the program, with its data and charts, to be simply copied to any other disk and run as if fully installed.

A pre-installed copy of **SOB** can run from a USB Storage Drive, Network Drive, even a large memory card.

NOTE: that SOB can NOT run from a CD-ROM or other read-only storage device, or any folder without read/write access privileges - SOB needs to be able to create certain files on the disk which is not possible with a CD-ROM or security protected drive.

SOB doesn't care where its folder is located on the hard disk, for example:

- C:\SOB (our default, and recommended, installation folder)
- C:\Program Files\SOB (in the regular Windows program folder)
- C:\My Documents\SOB (in your personal folder)
- D:\Navigation\SOB (second hard drive or other storage device)
- \\BRIDGE\C\Nav\SOB (network drive)

...are all valid locations for SOB.

For **Win2000** and **WinXP** computers, ensure that you have read/write rights to your SOB installation folder, both (1) while installing, and (2) whenever you run SOB. If you don't have multiple user ID's on your system then you may need to be logged-in as "Administrator"

SOB Installation Folders

C:\SOB

sOb.exe	The main program file.
COMM Detector.exe	Utility program to help configure the Serial/COM port that SOB uses
uninst.exe	If SOB was setup using a self-installing file (instead of simply copying it from another computer), this uninstall program will clean SOB off your computer, however, any Routes, Waypoints or Log files you created will not be removed.
SOB NMEA DATA.log	This NMEA logfile is appended each time SOB starts. NMEA data is saved to the file if checked on the Raw NMEA Data Form. This file can NOT be accessed whilst SOB is running, however after exiting SOB, copy or move this file to the SOB\LogFiles folder and rename it for easy recall to replay the voyage.
QuickStart.pdf	Print this file for easy reference while using SOB.
RELEASE NOTES.pdf	Printable document that highlights the new/different features with the latest version
ReadMe.txt/Notes.txt	Required text files.
Warning.txt/MOB.txt	SOB will not function successfully without these files present in the same folder as sOb.exe.
cmWin32.dll FSYS03.dll	Required C-MAP library files.
WWB00200.dll	The C-MAP world overview chart, used as the background chart in SOB.
mfc42.dll msvcrt.dll	Windows library files. Generally not required but included for any systems that do not have these automatically installed with Windows.

C:\SOB\DemoCharts

- **DMC0xxxx.MCV** Files of this format are unlicensed demonstration C-MAP charts from various locations around the world, including:
Sydney ; Auckland ; Singapore ; Maldives ; Hawaii ; etc
- **WWLA.MAB** World coverage of chart level A
- Licenced (purchased) C-MAP Charts are, by default, stored in:
C:\Program Files\C-MAP NT PC Selector\Charts

These licenced charts can be moved/copied to SOB's **C:\SOB\DemoCharts** folder. However you will need to Backup/Restore your Chart Licence Codes also to this folder from within C-MAP's **Chart Selector** program.

(see also [C-MAP Charts](#) on the website)

C:\SOB\Logfiles

- ***.log** Text file captures of NMEA data.
These files can be copied, archived, renamed etc using regular Windows file-manipulation techniques (Explorer, dragging etc)

NMEA Log files can be loaded into SOB and replayed as a simulation
- **!messages.txt**
All text from the Messages ViewPanel in SOB is periodically logged to the file

C:\SOB\Routes

- **{route name}.rte** each route created in SOB is saved in its own file
- **PastTrack001(yyyy-mm-dd).rte**
On program exit, or when requested on the **AllRoutes** form, SOB will convert the visible PastTrack to a regular Route file. This file can be re-loaded into SOB as a Route and reversed, activated, analysed etc using the standard Route tools.
NOTE: the PastTrack will NOT be automatically saved to a file if there has been less than (about) 20 minutes of running time.

Using Windows Explorer and normal file manipulation commands, these plain text Route files can be: deleted, archived, backed-up, emailed, copied and reloaded

C:\SOB\Waypoints

- **!default.wpt**
This is the "current state" of Waypoints used by SOB's last session ; and to be automatically loaded when SOB next starts.
- **{filename}.wpt**
User defined groups of Waypoints stored in their own files for easy loading/unloading into SOB
- ***.txt or *.csv**
Move/Copy any raw waypoint file lists in TXT or CSV format to this folder for importing into SOB via the AllWaypoints Form.
The raw files must be formatted as lists of waypoints in columns with the headings:
NAME, LAT, LONG.
Each field should be separated by a comma or semi-colon; Lat/Lng can be in any of the three regular formats for expressing an angle (dec-deg, deg-dec-min, deg-min-sec) if decimals are used, they must be a full-stop (ie: US/UK numbering format).

Example file format for a list of waypoints that SOB can automatically import:

File: SOB\Waypoints\Microline.csv

NAME,	LAT,	LNG
SINGAPR,	04°11.020,	134°55.885
SAVE011,	00°48.734,	124°11.743
SAVE012,	00°48.734,	124°11.743
SAVE013,	01°02.123,	124°22.150
BINTAN1,	01°10.754,	104°17.651
ROSEBAY,	-33°52.242,	151°15.950
SHOALBY,	-32°43.202,	152°10.432
KAPLAN ,	-34°23.043,	150°51.533
HELSGTE,	-26°22.751,	153°07.113
DREHUNC,	-20°54.543,	167°15.470
B'JOEY ,	-33°35.102,	151°19.531
RIVER ,	05°12.193,	110°16.172
BATANGI,	01°09.760,	111°55.483

C:\SOB\PastTracks

- **!PastTrack.txt**
When underway, SOB regularly logs information about the current position, speed, heading, wind, depth etc into this PastTrack file.
This file is useful for in-depth analysis of a journey (using Excel charting for example)
The **!PastTrack.txt** file will grow at about 1Mb every 24 hours while underway. We recommend you rename or delete this file periodically.
(refer to [Power Users](#) Chapter)
- **!LastTrack.trk**
Is a log file of the visible track from the previous SOB session, this is used to re-load the track from the last SOB session, when SOB next starts.
Creative use of this file allows any previous logged track to be re-loaded into SOB
(see [Power Users](#) Chapter)

C:\SOB\Routes\archived C:\SOB\Waypoints\archived

- Before any Routes, RawData, Waypoints, Logs, or PastTracks are overwritten, the original copy is moved to the appropriate archive folder for backup or retrieval